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PAPER TRADE JOURNAL

APRIL 4, 1946

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Designers & Builders
Paper Making Machinery

PAPER TRADE JOURNAL

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CONTENTS

APRIL 4, 1946

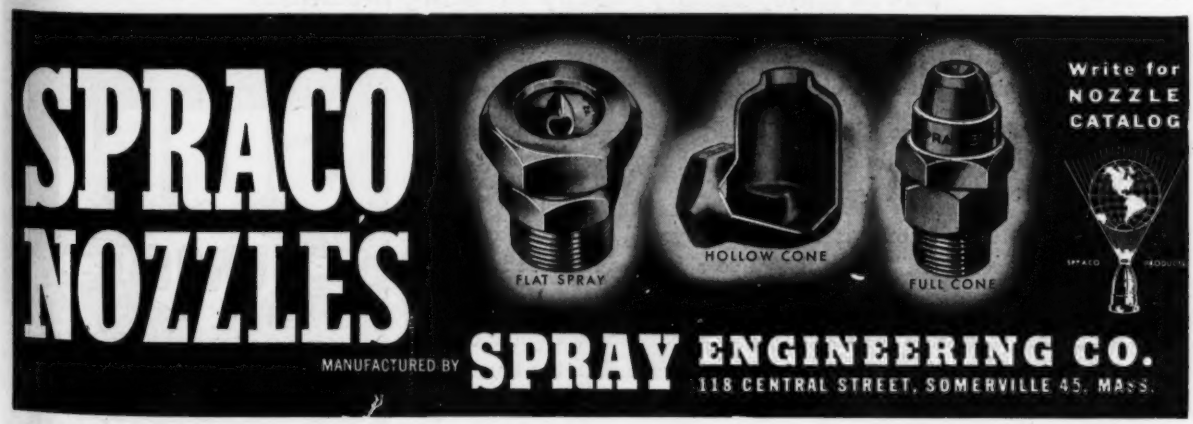
	PAGE
Paper Trade Hears Facts of Reconversion	7
Senator Brewster's Address	7
Holyoke Unions to Seek Wage Increase	10
Bookbinders Negotiate New Contract	10
Cy Norton Receives Testimonial	10
Strathmore Appoints Gibney	10
Keyes Returns to Hazen Paper	10
White Heads Boy Scout Campaign	10
Wisconsin Valley Plans 20-Mile Lake	12
Marathon Starts Work on Box Plant	12
Menasha Plant Resumes Construction	12
Canada Advances Lumber Eight Per Cent	14
Fire Destroys Eddy Pulpwood Pile	14
Too Late for More Newsprint to Britain	14
Turning Farm Land Back Into Forests	14
Curbs on Fine Paper Continued	16
Diversification in Newfoundland	16
M & O to Offer Insulite Siding	16
MacLaurin Joins Powell River	16
B. C. Pulp Installs New Barker	16
Provincial Paper Profits Off in 1945	16
NLRB Enjoins Ecusta	16
Pulp Men Protest Freight Rate Rise	18
Shaver Heads Continental Can Mills	18
Obituary	18
Financial News	20
H & W Offers 42,000 Shares	20
International Preferred Exchange High	20
OPA Revises Board Price	22
Keith Campbell Leaves Army	22
Fisher and Old Join Little	22
St. Lawrence Group Reports Profits	24
GPO to Get Surplus Paper	24
Hercules Moves Personnel	30
Hendrick Names Three	30
Oppose Scott Pier Plans	30
Editorial	32
Illick Takes Sabbatical Leave	33
Yale Offers D. For. Degree	33
Production Ratio Report	33
Latest Market Review	48
Miscellaneous Markets	50
Market Quotations	50
Imports of Paper and Paper Stock	54
Classified Advertising	56

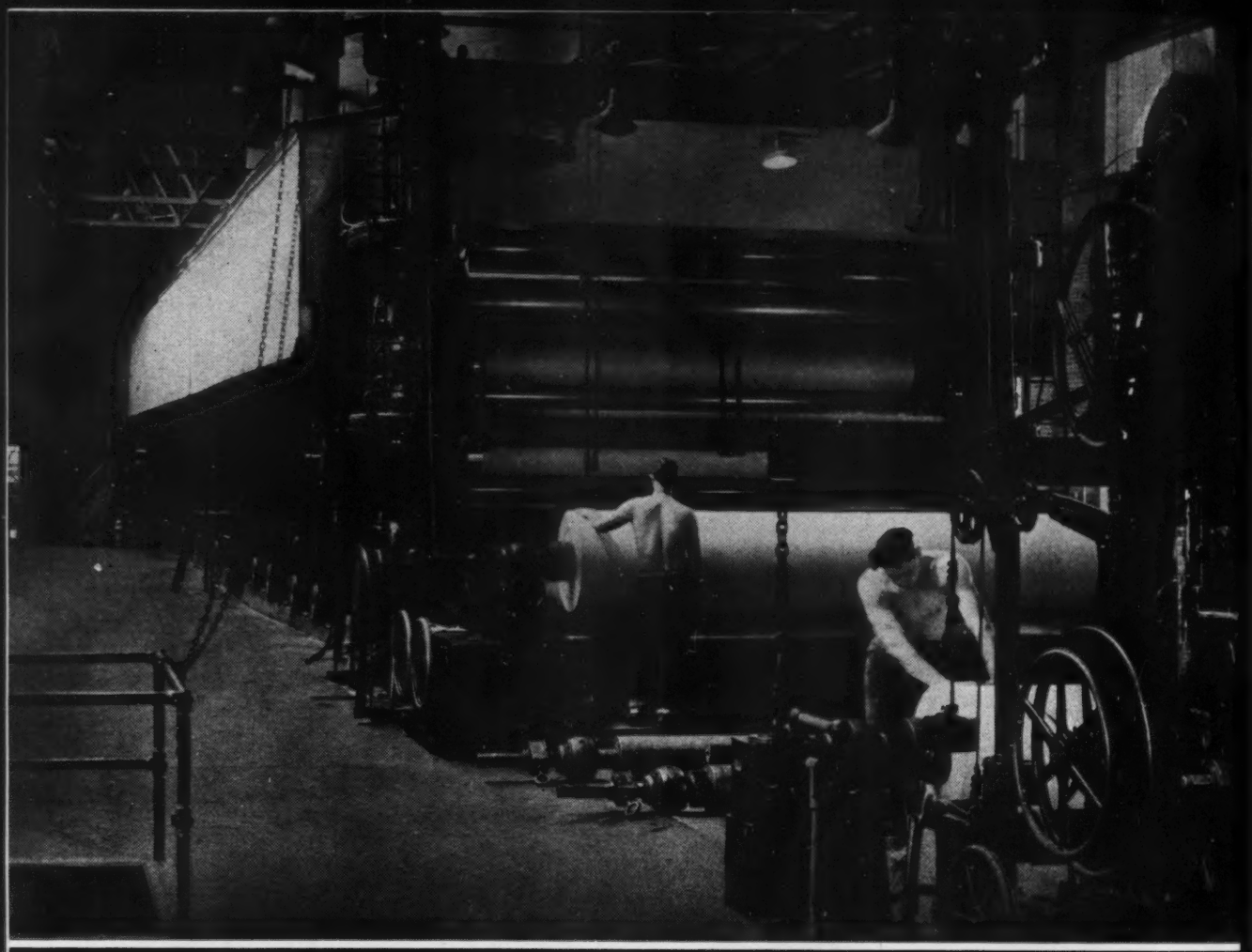
Technical Section *("TAPPI")*

Lignin-Filled, Laminated-Paper Plastics	35
The Engineer in Society	42
Sales Management	42
Applied Energy Conversion	42
A Stock Inlet for Paper and Paperboard Machines	43
An Effective Bleach Liquor System for Rag Halfstock Bleaching	45
TAPPI Notes	46
Products and Their Packaging	46
Water Plant Manual	46

PAPER TRADE JOURNAL IS INDEXED IN INDUSTRIAL ARTS INDEX

INDEX TO ADVERTISERS ON PAGE 66





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Vol. 122, No. 14

PAPER TRADE JOURNAL

Title Reg U S Pat Off

April 4, 1946

Paper Trade Hears Facts of Reconversion

National Paper Trade Association Gathers, 700 Strong, In Its 43rd Annual Convention—Listens To Government Problems and Learns Of Opportunity To Advise On Policy—Elects Carpenter President.

Before a well-packed convention that numbered nearly seven hundred registrations before it was half under way the National Paper Trade Association placed a program this week that was heavily loaded with sober thoughtful material. Though reconversion as an industrial process is well along in its course in the paper industry problems of the immediate and distant future dominated most of the discussion, with representatives of industry and of government matching their experience. One theme of recurrent quality in the talks was the necessity and advisability of a united effort by the industry to keep Washington informed of industrial problems.

G. E. Carpenter of Omaha, who has been vice-president for the wrapping paper division, was elected to the presidency. A. W. Towne of San Francisco, was continued as vice-president for the fine paper division. Ralph G. Luff was elected vice-president for the wrapping paper division.

Senator Brewster, the first speaker in the open portion of the program, pointed out that it is an excellent idea to consider together the problems of reconversion, for there has been a deep-seated lack of understanding between politicians and business men and each group has been finding out how little each knew of one another's problems. "We must sell Americanism, and unless business men take more interest in the business at Washington there will not be any business."

The country, he pointed out, is now going into a period to determine the future trend. Business must consider which way it is to go and must play its part in helping to restore intellect and character. "We must," he said "re-establish some of the comradeship which has been more or less disintegrated with specialization. Business has been in the doghouse but we are back once again with the opportunity to go ahead. There are very radical differences in what is right or left."

There are some pictures in Washington, the speaker pointed out, which "just do not make sense." He asked his audience to consider themselves an assembly of Fuller brush salesmen and take it upon themselves to sell millions of Americans on "what free enterprise is all about."

"We are all selling something, and we must know our goods, bearing in mind that we are a simple-minded lot."

For a period in his address, Senator Brewster dealt with the international situation, during which he minimized the "spy scares" and said it was the business of large Governments to spy. He referred to several political incidents of yesteryear in reference to how our own country expanded its boundaries; said it was "oil rather than the Iranians that the powers are worried about"; he urged patience with Russia.

The Senator called upon business men to take a real interest in politics, noting that labor takes much more interest in politics than businessmen. "The more," he said, "labor gets into politics, the more politicians get into labor and possibly there will be a day when labor leaders will not be needed. John L. Lewis has warned of possible totalitarianism."

Show the world, he pointed out, we can out-produce the world and that we can continually raise the standard of living.

"Other countries have a long hard road ahead. We have a head start and we can lick them on our home grounds. If we fail we have ourselves to blame. Show them we are worthy of our heritage. Isn't it strange that they are asking for billions of dollars to make their system work. Russia, you know, wanted some motion pictures. Included in the assortment they received were some riot pictures. When the Russians saw the pictures on the screen they were heard to exclaim, 'God, look at the shoes they are wearing!'"

In answer to a question, Senator Brewster said that back of OPA was a study of 10 years and the dominating design is to create chaos and to get business men to throw up their hands and call quits. He noted how "delicately phrased appeals" had been provided for consumption on the part of the public and from such a setup "collectivism may emerge."

G. E. Carpenter
Elected N.P.T.A. President

Grant Richardson, Hammermill Paper Co., warned that if government controls return to the paper industry "they will stay with us."

"Voluntarily police distribution to make sure we are not unknowingly helping someone to hoard. Voluntarily avoid wastage of scare supplies. Seek a clear understanding of current issues affecting our affairs. If our own houses are in order, we should take a firm position for or against all proposed Government or bureaucratic action offered as solutions to these current issues."

M. C. Dobrow, of the Writing Paper Manufacturers Association, sounded a note of caution. There is serious doubt that paper production can be maintained at the recent high levels, because there may not be a pulp supply in the next six months sufficiently adequate to maintain such a high level of production, according to this authority. Conditions influencing wood pulp supply during the next few months are extremely uncertain both as regards imports and domestic production. Due to the closing of navigation and the shortage of coal, deliveries from Sweden are now greatly curtailed. In addition, Swedish producers have become impatient with our OPA price ceilings and have threatened to withhold pulp from this market.

Perhaps the most important reason for expecting a relative scarcity, or an urgent demand for all paper produced, is the expected squeeze by periodicals on the total white paper supply. Since the lifting of limitations on consumption of paper by periodicals, plans have been carried forward aggressively to add to circulation lists all of those who have been turned away during the war.

Magazine advertising space, since the turn of the year, has been 18 per cent higher than a year ago, 37 per cent higher than in 1944.

Publications are also increasing the weights of paper they use. Some of the large publishing companies are planning new publications and these plans call for circulations running into the millions.

We can guess that the periodicals will go from a consumption of something like 700,000 tons to 1,000,000 tons. This will put a terrible squeeze on the whole white paper field.

The third important factor underlying the strong demand for printing papers in 1946 is reconversion needs. Printing buyers have not yet started to produce the huge volume of sales literature that will be needed, because of strikes and slowness in getting essential materials for the production of many consumer products and delay in determining price levels. When buyers of printing do get into action, printing plant schedules will show a big backlog.

The outlook for the paper industry in 1946 is clearly one of high volume. Full production and scarcity are clearly in prospect for practically all of 1946. Production may be limited by inadequate supplies of raw materials, particularly in the next six months.

Before closing, I would like to leave with you three suggestions or ideas which may be helpful in your thinking. Although you are free to buy any weights you or your customers wish, if you want more paper in terms of yards rather than weight, why not buy and sell the lighter weights. A good salesman might sell him the idea that if his quota is 10 tons—10 tons of substance 20 will give him 1,000 reams of folio. If he takes substance 16, he will get 1,250 reams, or 25 per cent more yardage.

Further inflation—certainly not of the run-away kind, but inflation nevertheless—will be a factor in the economic picture for 1946. No one conducting any kind of business can avoid taking this factor into his considerations.

The second point brings me to my third and last—Perhaps we shouldn't overlook the fact that sometime in the near future we shall be approaching the time in the paper cycle when, both the buyer and the seller, should be on his guard against speculation.

For the government as a user of paper, A. E. Giegengack, Public Printer, declared the possibility of some forceful action might impend. "The Government Printing Office," he said, "has earnestly tried to work out its problems with the paper industry. Then on March 18 we opened bids for the new 3-month period and got 55 percent coverage. The coverage we got is on practically the same items as in the last contract period. The only difference is a slight gain on chemical wood writing, ledger, and index. The no-bid items are the same—catalog news, English-finish book, dull coated book, coated cover, wood manila, kraft, cardboard, and newsboard.

"Who is getting all this paper, now that the War and Navy Departments are practically out of the picture and Government Printing Office needs have been reduced from 1½ million pounds daily to half a million pounds? Well, the greatest part of it is going to commercial printers who used to fill their presses with Government-quota paper. Return to higher-weight stock uses up a little more. And, of course, there is buying for inventory to replenish empty shelves.

"The purchase of mills by publishing houses has removed several of the biggest as sources of general supply. Incidentally, several of them were mills making paper for the Government Printing Office.

"I am quite serious when I say that some paper men think the Government doesn't need paper now. Perhaps they do not really think it, but at least they are saying it.

"The Government Printing Office operates under the supervision of the Congressional Joint Committee on Printing. By law it is required to take care of all printing and binding for the Government service, including the military forces, both at home and abroad. It is absolutely imperative that a source of supply for the many grades of paper used in this work be available. Without paper, we cannot print. Without printing, there is the threat of disaster to important programs of the Government. I have in mind the return of veterans to civil life, printing for the Congress, publication of the Federal Register, printing of the hearings before congressional committees on important questions facing the country today, and the regular daily demand for standard forms and publications, such as any going business needs. We are furnishing the country with 8 million postal cards daily. Suppose you went into the Post Office and found that you couldn't buy postal cards or fill out a money-order application. These are just a few printing jobs we have to do. The total amounts to more than 100,000 individual jobs annually, and there is seldom a time that there are not at least 10,000 jobs in some stage of production.

"Take the case of the Veterans' Administration. Pick up any daily newspaper and read the accounts of the inability of the Government to keep up with the millions of varied applications being received from veterans. As a paper specialist, every one here

(Continued on page 22)

ETERNALLY ON THE JOB

Worm's eye-view of a Vickery Felt Conditioner in action.

KEEPING PRESS FELTS IN CONDITION TO DO THEIR BEST WORK

Tucked away out of sight the Vickery Felt Conditioner keeps quietly and steadily at its job of maintaining peak performance from press felts.

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Every press felt needs continuous conditioning. If yau have any question about it get in touch with Bird Machine Company, South Walpole, Massachusetts, builders of

VICKERY FELT CONDITIONERS

Holyoke Unions to Seek Wage Increase

Present Contract Expiring June 1 Opens Door For Renewed Demands By Mill Forces—Bookbinders Sign New Contract—Gibney Succeeds Norton At Strathmore As Latter Receives Testimonial.

HOLYOKE, Mass.—The Holyoke paper mill unions will ask another wage increase in April, but the amount to be requested has not yet been decided upon. The paper mill wage contract extends to June 1 and contains a provision that both parties shall give 60 days' notice of their intentions in regard to continuing it, changing it or dropping it. An appeal for price relief in the local paper industry is certain to follow the wage demands. Local manufacturers will balk strongly at granting further wage raises without price increases.

The new Wage Stabilization Board, which has taken over the staff and functions of the War Labor Board is now in the process of forming patterns for wage increases throughout the country. It is possible that such a pattern for the paper industry in this region may be established before the local contract expires.

If it is, increases can be granted up to the limit set in the pattern. These patterns are not to be set on a nation-wide basis, such as a general following of the recent 19½-cent and 18½-cent raises in major industries. Rather the patterns will be different for individual industries and regions.

But wage increases must precede price increases and generally speaking manufacturers will not have an advance promise of a price increase as in the case of Big Steel.

The paper manufacturers and the local union after prolonged collective bargaining agreed last December on raises retroactive to November 19. The increases were seven cents an hour for all earning less than 70 cents and six cents an hour for those earning 70 or more. With these raises the machine tenders got $1.16, $1.19 and $1.22 an hour.

Millwrights got $1.06½ an hour and the lowest base rate for common labor became 71 cents an hour.

Last spring the unions got a three cent hourly increase and during the summer the NLRB allowed shift premium pay of four and six cents an hour besides extra pay for additional holidays and sixth day work.

Bookbinders Negotiate New Contract

The proposed new contract of the International Brotherhood of Bookbinders AFL local 48, will be submitted to the officials of the National Blank Book company on May 1, according to a statement made by union officials after a meeting at which the proposed contract was discussed. They further stated that this year's contract differs but little from that of last year, and inasmuch as the 1945 contract seemed to be completely acceptable to the employer no trouble is anticipated in reaching a quick agreement on the new contract for this year.

The union represents about 750 hourly paid workers. The officers of the local are President Raymond Lacroix; Vice-president C. Joseph Burke; secretary, Phillip Beaudry and treasurer, Harry Wagner.

The negotiating committee which will present the union terms to the National officials will be: Walter Felsentrager, George Guay, Daniel Kelly and George Boettcher.

Strathmore Appoints Gibney

Albert L. Gibney has been appointed sales promotion and public relations manager of Strathmore Paper company, West Springfield, succeeding Cy Norton, who resigned recently.

Gibney returned to the company recently after service with the navy since the summer of 1942. Before entering service he was assistant sales promotion manager and represented the company in the southern and southwestern territories. He joined Strathmore in 1939 after he had held an executive position in the jewelry industry.

He is a graduate of Darthmouth college and he specialized in problems of sales management and advertising. He is also a graduate of Harvard business school.

Cy Norton Receives Testimonial

Employes and management of the Strathmore Paper Company joined late last week in bidding farewell to Cyril F. Norton, when he was presented a solid gold wrist watch by F. Nelson Bridgham on behalf of the employes at a luncheon at the Colony club. Members of the executive committee of the company and the sales group were present. Norton also was presented with a 25-year award by the company in recognition of his long service. He is leaving April 1 to take up a new position with the Association of National Advertisers. He has been employed by Strathmore as sales promotion manager and public relations representative.

The luncheon was the occasion for many congratulatory remarks by those present on his new position and praise for his fine record with Strathmore.

Keyes Returns to Hazen Paper

HOLYOKE, Mass.—Lieut. Charles C. Keyes, former New York representative of the Hazen Paper Co., has resumed work there after having been released from the navy.

White Heads Boy Scout Campaign

SPRINGFIELD, Mass.—Advertising Manager Eliot L. White of the United States Envelope Co., is campaign manager to raise funds for increased camping facilities at the Boy Scout reservation donated by Horace A. Moses, chairman of the board of the Strathmore Paper Co.

Soundview Earns $1.21

The Soundview Pulp Company for 1945 reports a net income of $717,379, equal to $1.21 each on 488,250 shares of common stock, compared with $754,154, or $1.29 a share.

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- Sodium Sulfide
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- Sodium Sulfite (Anhydrous)
- Sodium Bisulfite (Solution or Anhydrous)
- Disodium Phosphate
- Trisodium Phosphate
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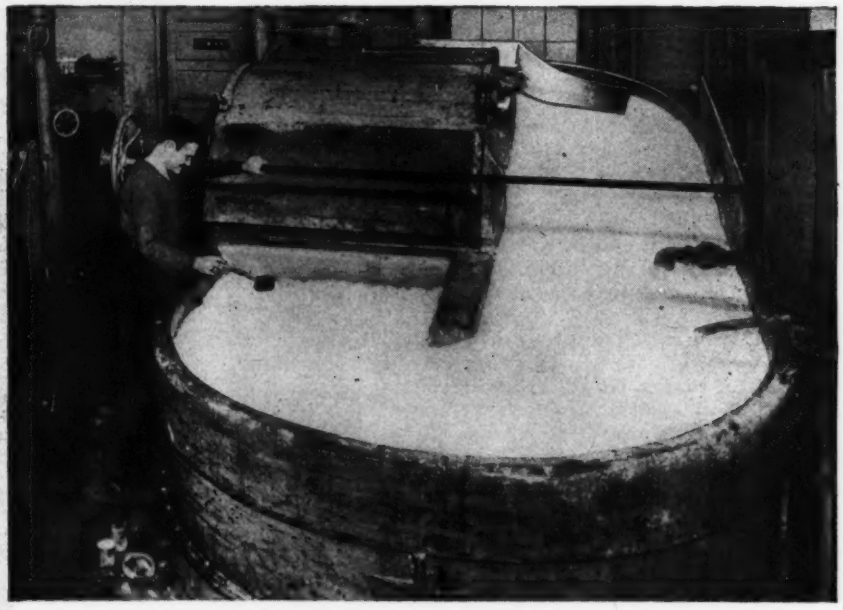

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Next time, specify these quality General Chemical products for *your plant:*

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Appearance: Opalescent to clear
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Wisconsin Valley Plans 20-Mile Lake

Dancy Project Is Ready To Begin Development of Area For 50 Percent Increase of Power Output—To Name Lake For George W. Mead Who Pioneered the Plan — Marathon Starts Box Plant.

APPLETON, Wis.—The "Dancy Project," for many years the dream of the Wisconsin Valley Improvement Company, Wausau, Wis., may become a reality, starting this year. All that is needed to start construction is the aproval of the Wisconsin Public Service Commission at Madison, Wis. It will more than double the storage capacity of the Wisconsin River reservoir system, and will increase by nearly one-half the output of the river's many power plants. It will create the largest man-made lake in Wisconsin. Most of its waters will be pumped uphill from the spring flood waters of the Wisconsin into the Dancy valley basin.

Announcement to this effect was made Monday, March 25, in a joint statement by M. W. Kyler, vice president and general manager of the Wisconsin Valley company, and D. C. Everest, also a vice president and one of the original members of the board of directors and president of Marathon Corporation, Rothschild, Wis.

The project will be named in honor of George W. Mead, president of the Improvement company and of the Consolidated Water Power and Paper Company at Wisconsin Rapids, Wis. It will be located 25 miles south of Wausau in the Little Eau Pleine valley, west of Dancy, Wis.

"The cost of the project," says the statement, "will be about $2,500,000. Annual operating costs will total approximately $215,000. It will be financed without cost to the taxpayers by the Wisconsin Valley Improvement Company, whose stockholders represent paper mill and electric companies with hydro plants on the Wisconsin river.

"The storage reservoir will be built 25 miles south of Wausau in the Little Eau Pleine Valley west of Dancy. It will be named the George Mead reservoir in honor of George W. Mead, Wisconsin Rapids, president of the Improvement company and president of the Consolidated Water Power and Paper Company. Mead and the late L. M. Alexander when president of the Nekoosa-Edwards Paper Company were the pioneers who envisioned the reservoir system in its entirety.

"Construction will be started as soon as approved by the Wisconsin Public Service Commission and as rapidly as materials and the remaining flowage lands still needed are purchased."

Mr. Kyler, in explaining the significance of the engineering phases, said that the completion of the project will enable electric plants to generate as much additional electricity on the Wisconsin river alone as is now generated by all the water power plants in the state for an average month.

The new lake will be 9½ miles wide, 20 miles long, and 25 feet deep. Its storage capacity will be 18,730,000,000 cubic feet, 75% of which will be taken from the flood water flow of the Wisconsin river, which heretofore has caused great flood damage.

The Improvement company's reservoir system has a present capacity of 17,000,000,000 cubic feet, or the equivalent of a river one foot deep and 135 feet wide, extending around the earth at the equator, according to Mr. Kyler. Thus the company's river power-generating capacity will be increased by 49%. When the stored water is released from the reservoir it will pass through 10 dams with an aggregate head of 236 feet.

Marathon Starts Work on Box Plant

Construction has been started at Marathon Corporation's new carton and folding box plant at Manasha. The Permanent Construction Company of Milwaukee, is the general contracting firm. The new building will be located directly across the Fox river from the present manufacturing buildings of Marathon. It will provide ample manufacturing space for increased production of the company's line of quality food packages. Warehousing facilities and easy access to rail connections also will be provided.

Four units are included in the project — three manufacturing and one warehousing area, with a total floor space of 320,880 square feet on the main floor and basement. Materials have been on order for several months and construction will proceed as rapidly as possible. When the project has been completed the building will be a 1-story, U-shaped layout, 810 by 340 feet, constructed of rainforced concrete with brick and concrete exterior.

Menasha Plant Resumes Construction

Shortage of materials has delayed construction of the roll storage building of the Menasha Woodenware Corporation, Menasha, Wis., but work was resumed last week. Enough bricks now have been obtained to complete this and the corrugator building also being erected.

Most of the corrugator building has been completed and the corrugator machine is expected to arrive in April and to be in operation by June 1. This building is expected to be finished by May 1, and several of the offices now in the main office will be moved to the upstairs floor of the corrugator building about that time. Several other offices in the old box plant will be moved into the new building.

The new corrugator machine, which has been on order for three years, will produce in one shift what formerly was done in two shifts. It will be equipped with a double cut-off and will be an 85-inch machine in width as compared with the 72-inch machine now being used.

The corrugator building will be L-shaped and will by 32 by 377 feet and the wing will be 32 by 118 feet. The building is of concrete and steel with a red brick exterior. White glazed tile bricks line the inner wall as an additional sanitary factor.

The roll storage building will be 58 by 180 feet and will adjoin, nearly as a single unit, the corrugator building. This structure also is of brick and steel and will have an overhead crane which will also serve the corrugator buildings.

Between the old roll storage house and corrugator building is the new roll storage building. A railroad track will be extended to run between the two roll storage buildings and up to the corrugator building, serving all three.

The Widgeon at Work

To executives in the paper industry, the *Grumman Widgeon Amphibian* offers a trustworthy means of travel to remote mills in a fraction of the time formerly required.

To the convenience of combined land and water operation the *Grumman Widgeon Amphibian* adds the tradition of rugged dependability for which Grumman Navy planes are famous. Its versatility and roomy cabin make it the logical choice of executives.

Applied war experience gives the new 1946 *Widgeon* improved water performance and increased utility.

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Canada Advances Lumber Eight Per Cent

Anti-Black Market Move Is Adopted Without Increase In Price of Newsprint — Fire Destroys $2 Million Pulp Pile — Britain Seeks Supply Too Late — Dominion Continues Control On Fine Paper.

MONTREAL, Que.—In an attempt to halt the pressure on inflation, the Government has announced an increase in the prices of a limited number of commodities, including lumber and furniture. As to lumber, the increase, which is described as designed primarily to smash the black market, is 8 per cent f.o.b. seller's premises. New ceilings in pulp and paper (except newsprint) will increase about 7 per cent.

While admitting "an undoubtedly bad situation" in respect to lumber, the Prices Board says retailers will not be allowed to increase prices, but "additional supplies should go far to reduce costs." It is further stated that increase in the price of pulp and paper does not affect newsprint. The increase "gives some recognition to increases in wood and labor costs that have already occurred, but will leave Canadian domestic prices considerably below export prices. We do not admit the contention in this or any other field that domestic prices should rise to export levels. To do so would mean the end of price control in Canada."

Fire Destroys Eddy Pulpwood Pile

The huge stockpiles of pulpwood of the E. B. Eddy Company's paper mills at Hull, Que., have been destroyed by a fire which started last Thursday evening and which has caused damage estimated at $2,000,000. The mills were saved as a result of heroic all-night work by the fire brigades of both Hull and Ottawa. Net loss to Eddy is placed at about $500,000 in pulpwood and $200,000 in equipment. The company has arranged to replace the supplies of wood consumed.

It is thought that a grass fire spread to the pulpwood piles before it was observed. When discovered at 7 p.m., by a fisherman in the river, the fire had a strong hold on the woodpiles, and was being fanned by a stiff wind. It spread rapidly and afforded a terrifying spectacle to Ottawa people, being only a short distance across the river from the Parliament Buildings and the leading Ottawa hotel. Part of the bridge leading from Hull to Ottawa was destroyed, several spans being left a waving, twisted, buckled mass of hot steel. Only a shift of wind saved a group of oil tanks nearby. Two box cars laden with chlorine gas used in the manufacture of pulp were jerked out of the path of the fire with only minutes to spare, and hundreds of tons of sulphur were wetted down as a precautionary measure.

The disruption of operations at the Eddy plant will have a serious effect on the already short supply of paper in the domestic market, for the company manufactures an extremely wide variety of fine papers, tissues, poster, bag and cover papers, paper boards and sheathing, the capacity being 200,000 lbs. per day, while the ground wood and sulphite mills have a capacity of 250,000 lbs. of ground wood per day and 220,000 lbs. of unbleached sulphite.

"Too Late" for More Newsprint for Britain

As recorded last week, when the British Government last fall cut down contracts for the supply of 220,000 tons of Canadian and Newfoundland newsprint in 1946 to token imports of 50,000 tons, Canadian manufacturers at once made commitments for placing the newsprint elsewhere, and cannot now supply Britain with anything beyond 50,000 tons in the present year. Apparently British newspapers, anxious to increase the size of the dailies above the present four pages, are now trying to get the Government to allow imports of extra supplies of pulp, so that the newsprint can be manufactured in British mills, and are finding that it is too late to do anything about this either.

According to a cable, the matter has just been brought up in the British House of Commons. One member, referring to the Anglo-Canadian loan agreement just negotiated with Canada, asked if negotiations were under way with Canada for increased newsprint imports.

Premier Attlee replied: "The newsprint situation is being kept under review to see if Britain can afford additional supplies, but it is thought no more pulp is at present available from Canada. Financial assistance received from the Canadian Government does not free us from the need to husband our resources carefully."

The questioner replied that the Canadian Government "generously offered pulp transport and dollar finance," and asked "why not deal with these very generous people and let us have the truth?" Mr. Attlee replied: "I don't need to be told of the generosity of the Canadian Government. My information is that pulp is not available."

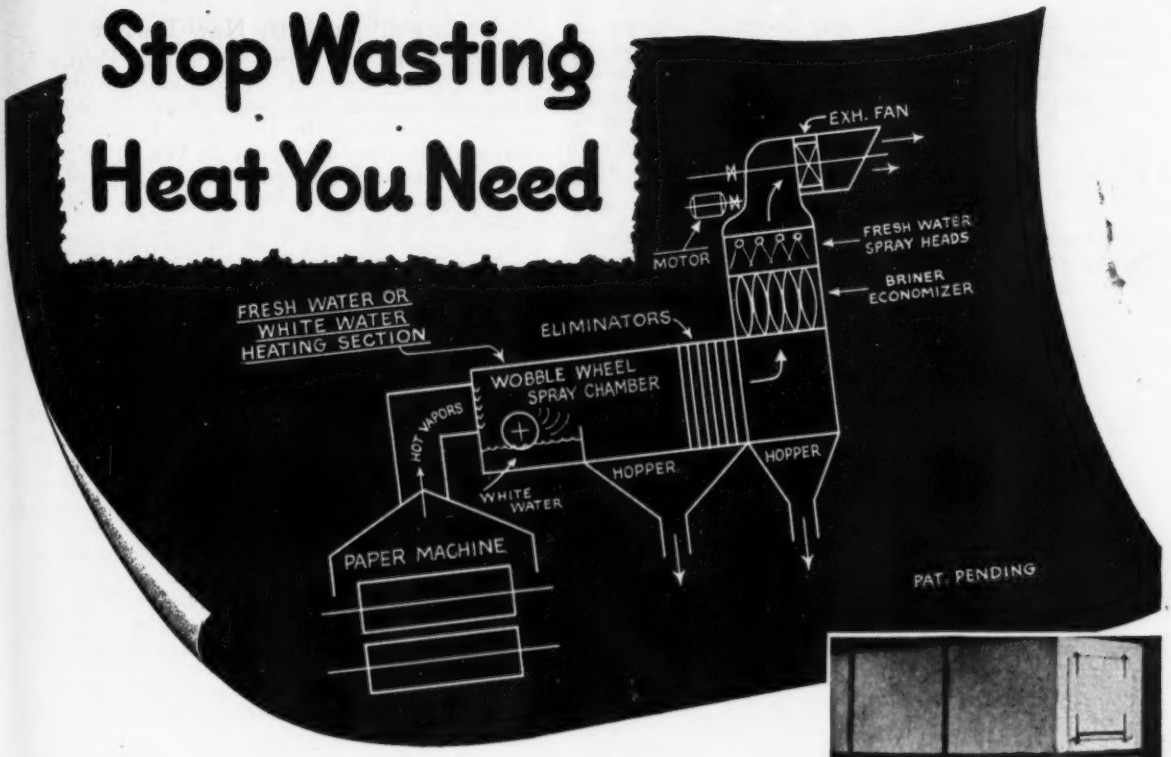
Turning Farm Land Back into Forests

A right-about-turn in the land policy is under way in Canada, according to Robson Black, president of the Canadian Forestry Association. The era when the pioneer was the hero who could say "two blades of grass now grow where only one tree grew before" is over, and now in Quebec more farm land is being put back into forest each year than is hewn out of the forest.

Fortunately, he added, while many other countries had created huge desert wastes through destruction of their forests, Canada had not had time to do irreparable damage to her forests, and had been awakened to the need of forest preservation in time. The end had come to the day when it was thought the height of wisdom to "clear the wilderness to make a farm." "It is now becoming generally recognized," he said, "that Canada's economy is based upon her forests, and that this vast natural resource must be developed rapidly and steadily and on a permanent basis. In no other place in the world can newsprint be made as conveniently and as economically as in Canada. But with 400,000,000 cubic feet cut off from the credit side of the ledger every year, there is urgent need for a comprehensive replacement program supported by every Canadian."

He told a public gathering in Montreal that Canada might well take a lesson in forest conservation policy

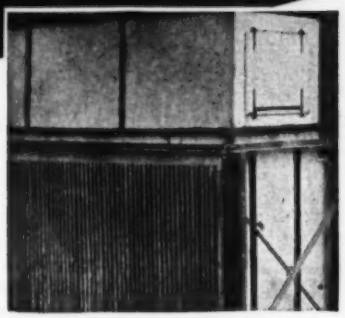
Stop Wasting Heat You Need



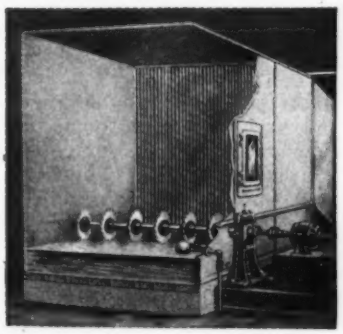
New Method Recovers Millions of B.T.U.'s From Heat Being Wasted

This modern Ross system, combining use of the Ross Briner Economizer with the Ross Scrubber, saves thousands of pounds of steam per ton of production by extracting heat from exhaust vapors. By this method either or both fresh water or white water is heated as well as exhaust air for maximum heat recovery. White water is heated first, then air by the economizer and finally the fresh water. This remarkable new heat recovery method is effecting saving of $1.00 and more per ton of paper produced. Installation of this system is practical even in the South.

Where less than maximum heat recovery is required it is possible to install any one or a combination of Ross Briner Economizer and fresh or white water heating equipment. Consult our engineering staff on your particular requirements.



View of Ross Briner Economizer



Cutaway view of Ross Scrubber

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CARRIER—ROSS ENGINEERING COMPANY, LIMITED, LONDON, ENGLAND

from Sweden, where, with only one-third as much woodland, forest industries employ an equal number of men, and costs of fire protection and fire conservation total only $100 a month. He also declared that replacement of forest wealth had attained such a point in Sweden that one 700-year-old forest industry concern today had better timber stands than it had seven centuries ago.

Echoing his words, Hon. John Bracken, leader of the Opposition in the federal Parliament, said that the grandest advertisement that the Canadian nation could issue to the world "is that our land from sea to sea has been placed under the rule of conservation." Referring to "the disastrous impact of 6,000 forest fires annually in Canada," he said it was time Canadians identified each forest fire not as a flaming spectacle but as a dropping barometer of national employment.

Curbs on Fine Paper Continued

Shortages in the supply, as compared with the demand, for all kinds of fine paper is such that the Prices Board has abandoned its plan to remove controls on this paper, which had been scheduled for March 31. The Board has announced that restrictions on supplies will continue indefinitely, and will apply to the manufacture of envelopes, book, writing and specialty papers.

Diversification in Newfoundland

J. C. Brittain, Canadian Trade Commissioner in Newfoundland, reports that the two newsprint mills there have been experimenting with various specialized products, and exports of laminated board for the manufacture of cardboard boxes have already been made. In addition, wrappers of various qualities have been manufactured. He states that in the last two months of 1945 both mills encountered a shortage of woods labor, "which curtailed sulphite pulp exports in one mill and resulted in slightly reduced newsprint production in the other." In the year employment was given more than 9,000 men in both mills and woods operations.

M & O to Offer Insulite Siding

A new Insulite product for exterior use in remodeling and resurfacing homes and other structures is announced by C. T. McMurray, vice president in charge of sales of Minnesota and Ontario Paper Company, of which Insulite is a division. This new product, Insulite Siding, is made with ½-inch Insulite Graylite Board as the base, thereby embodying insulating and strength qualities and will be available in popular colors of red, a white blend in brick designs, and a gray blend in stone designs.

Insulite Siding will be manufactured at Minneapolis and Detroit and distributed from those points in volume about July 1, 1946.

MacLaurin Joins Powell River

POWELL RIVER, B. C.—D. J. MacLaurin has been appointed control superintendent of the newsprint mills of Powell River Company, Ltd. Mr. MacLaurin was born in Revelstoke and educated in Victoria, B. C. He was graduated from the University of British Columbia as B.A.Sc. (chemical engineer) in 1932. Since graduation, he has been with the chemical engineering division of the British Columbia Pulp and Paper Company, and the British Columbia Sugar Refining Co.

B. C. Pulp Installs New Barker

VANCOUVER, B. C. — British Columbia Pulp and Paper Company, Limited, is installing hydraulic barking machines and a new power plant at its Woodfibre plant, according to Lawrence Killam. Mr. Killam states that installations in the Woodfibre plant have shown that the barker saves nearly 20% of the wood as compared with the older method of stripping the bark by knives.

In the annual report of the company just released, Mr. Killam states, the shortage of necessities caused some curtailment in production of the plants of the company at Woodfibre and Powell River last year and that as a result only 80% of the capacity was attained. He states that market demand continued, however, greatly in excess of the output.

Other important information in the report is the declaration of a dividend of $1.75 per share on the 7% preferred shares payable May 1, record April 15, amounting to $9,734. This is the first dividend on the preferred since 1931. During 1945 the company paid off deferred interest on the 7% general mortgage bonds to the amount of $344,222 and completed all interest payments in full to date.

From 1945 earnings the company carried $414,541 to earned surplus after special writeoffs of $101,149 for depreciation in inventory values and $25,000 for contingencies.

From 1944 earnings, when no corresponding writeoffs were made, the amount carried to earned surplus was $352,721.

Operating profit in 1945 was $1,802,674 against $1,477,079. Taxes on income were $540,000 against $300,000 and depreciation allowance was $375,863 against $445,000. Regular bond interest was about the same, $303,525.

Consolidated earned surplus of the company was reported at $991,439.68, on December 31, 1945, as compared with $623,246.02 at the same date the year before.

Provincial Paper Profits Off in 1945

TORONTO, Ont., March 16, 1946—Provincial Paper, Ltd., for the fiscal year ended last December 31, showed operating profit at $931,664, down from $1,154,905 in 1944. Estimated Dominion income and excess profits taxes were down from $382,500, in 1944, to an estimated $165,500, in 1945.

Depreciation in each year was charged in the amount of $300,000. Charges for bond interest, including United States exchange, were down from $176,092, in 1945, reflecting further sinking fund retirements. The regular dividends at the rate of 7 per cent per annum were paid on the 7 per cent cumulative preferred stock.

The balance sheet shows a decrease in working capital of $50,086, from $3,614,764, as of Dec. 31, 1944, to $3,564,678 at the end of 1945.

NLRB Enjoins Ecusta

BREVARD, N. C.—According to telegraphic advices from Washington, the National Labor Relations Board announced March 29 it had called upon the Ecusta Paper Corporation and two allied corporations, this city, to cease and desist from any activities tending to discourage their employes from joining a labor union. As noted, the action was taken after hearings which were held upon a complaint filed by the International Brotherhood of Paper Makers, AFL.

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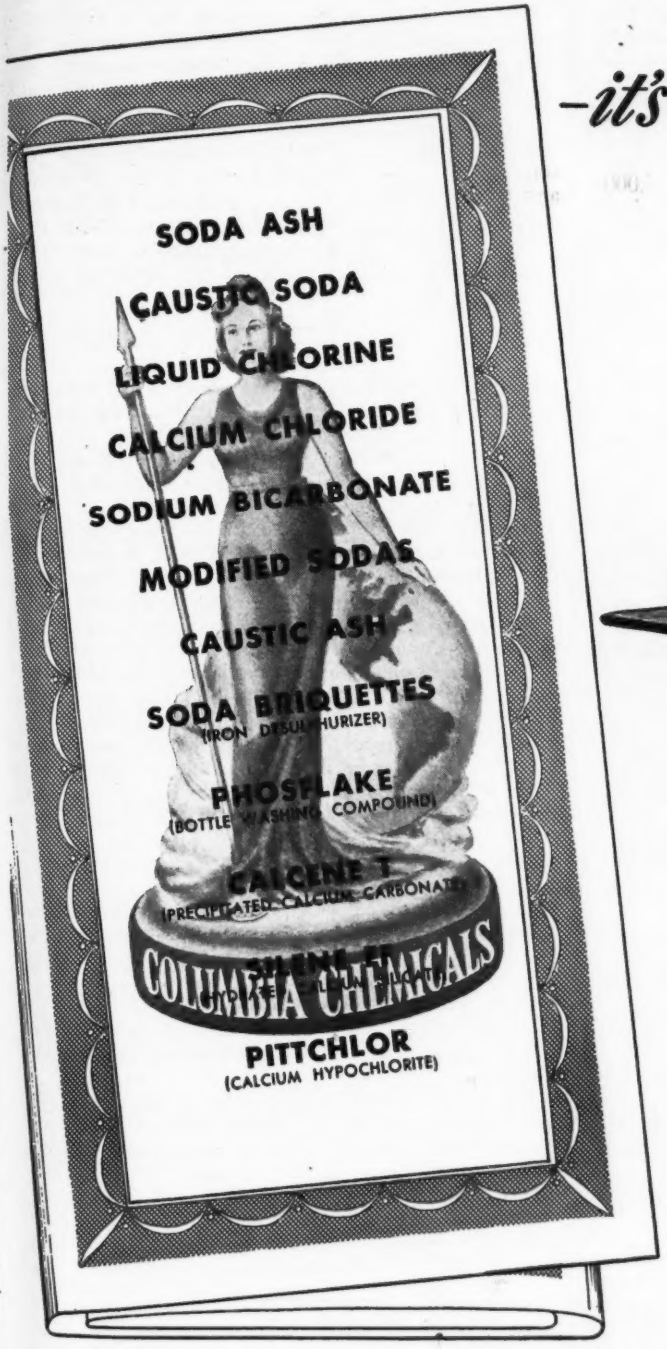

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Pulp Men Protest Freight Rate Rise

RALEIGH, N. C.—The North Carolina Utilities Commission on March 27 heard the request for a five per cent increase in the rates on pulpwoods and other woods made by railroads operating in North Carolina. This step follows a delay of some two years—a delay consisting of various postponements requested by the railroads and concurred in by the shippers. The railroads' request was protested by various shippers whose representatives attended the hearing. Paul D. Cook, of the Champion Paper & Fiber Company, spoke for the protesting shippers. He objected to the proposed increase on grounds that it is not justified. He also pointed out that, while his company used rail movement exclusively, it would consider truck hauling if rail proved too costly.

J. E. Bullock, of the Halifax Paper Manufacturing Company, took exceptions to the exhibits offered by the respondents on the ground that most of them were taken at an abnormal time. He stated that the summer of 1945 was so wet that the mills had to rely more heavily than normally on rail transportation.

F. W. Caytor, of the Mead Corporation, contended that to grant an increase would upset the "pattern" of uniformity toward which the shippers were working.

In the testimony offered this week, it was pointed out that in 1938, the Interstate Commerce Commission isued an order permitting a ten per cent increase in interstate rates on pulpwood and other woods. Since that time, it was stated, the North Carolina commission had permitted an increase of five per cent. Now the railroads are asking an additional five per cent increase in order to bring the intrastate rates up to the interstate level.

In substance, it was pointed out by the News & Observer, the railroads' representatives sought to show that the present rates are below normal, below the interstate rates, and below South Carolina rates.

Upon cross examination, L. D. Adcock of the Southern Railway, admitted that his company had applied for increases in Alabama and Georgia and the requests had been refused.

Asked if pulpwood rates in the South are not "missionary" rates in order to promote the paper industry, he replied that they might have been 25 or 30 years ago, but that they are not now. He pointed out that a good deal of paper moves by water rather than rail.

M. T. Power, of the Seaboard Air Line Railway, testified that the Interstate Commerce considers earnings of 7.5 mills per ton-mile as approaching the minimum limit of revenue for carload traffic, and that practically all of the Seaboard's ton-mile earnings for distances beyond 50 miles, which he introduced into evidence, are less than that figure.

Shaver Heads Continental Can Mills

R. W. Shaver has been appointed general manager of the paper mill division of Continental Can Company. This division, which is part of the over-all paper division comprises two paper manufacturing mills located at Filer City, Michigan, and Lyons Falls, New York.

Mr. Shaver, who was formerly vice president and general manager of the Gould Paper Company, Lyons Falls, New York, recently acquired by Continental Can Company, will continue to make his headquarters at the Lyons Falls plant.

OBITUARY

Eugene Howard Clapp

Eugene Howard Clapp, 74, treasurer and director of the Penobscot Chemical Fibre Company and the Tileston & Hollingsworth Company died at his home in Swampscott March 18. He was well known in the pulp and paper industry and became treasurer of Penobscot Chemical Fibre Company in 1906. He had been connected with the Tileston & Hollingsworth Company as treasurer since 1910. He was also a director of the Cotton & Woolen Manufacturers Insurance Company and the New Jersey Rubber Company. He was born in Boston and attended the Boston English High School and was graduated from the Massachusetts Institute of Technology in 1895. He is survived by his sisters, Mary A. Clapp and Mrs. George A. Clapp.

Arthur F. Allen

Arthur F. Allen, assistant manager of International Paper Sales Company, Inc., with headquarters in New York, died suddenly in Atlantic City on March 31. Funeral services were held at Frank E. Campbell Funeral Church, Madison Avenue and 81st Street at 12 noon April 2.

Mr. Allen was 59 years old and was born in North Creek, N. Y. He served as a lieutenant in the U. S. Air Force in the first World War, and then went into the paper business. He was associated with Finch-Pruyn Company, Tidewater-New York Times Company, Canadian Newsprint Company, and then with International Paper Company with which he was connected for 17 years.

Mr. Allen is survived by his wife, Mrs. Mabelle D. Allen, a step-daughter, Mrs. Charles Glett, his mother Mrs. Martha E. Allen, and a brother Fred Allen, who is manager of manufacturing of Canadian International Paper Company in Montreal.

Lee A. Daines

Lee A. Daines, 52, vice president and general sales manager of Heppenstall Company, Pittsburgh, Pa. and Bridgeport, Conn., died very suddenly early on the morning of March 29, in Miami, Fla. He was born in Jackson, Mich., on January 28, 1894, and attended Albion College and the University of Michigan. During World War I, he served in the Air Force.

Mr. Daines joined Heppenstall Company in 1923 and was assigned to the Detroit office. A few years later he was transferred to the company's Chicago office where he was district manager until almost a year ago.

On May 1, 1945, Mr. Daines was elected to the position he held at the time of his death. He had been a director of the company for eight years.

Richard G. Benedict

HOLYOKE, Mass.—Richard G. Benedict, salesman for the Valley Paper Co. here at the turn of the century, died recently in New York city, it was learned here this week. Benedict was a shipping clerk for the Norman Paper Co. in 1895 and left Holyoke in 1906 for North Adams where he was a salesman for the Valley Paper. He left North Adams after a few years and moved to New York where he established his own paper brokerage firm.

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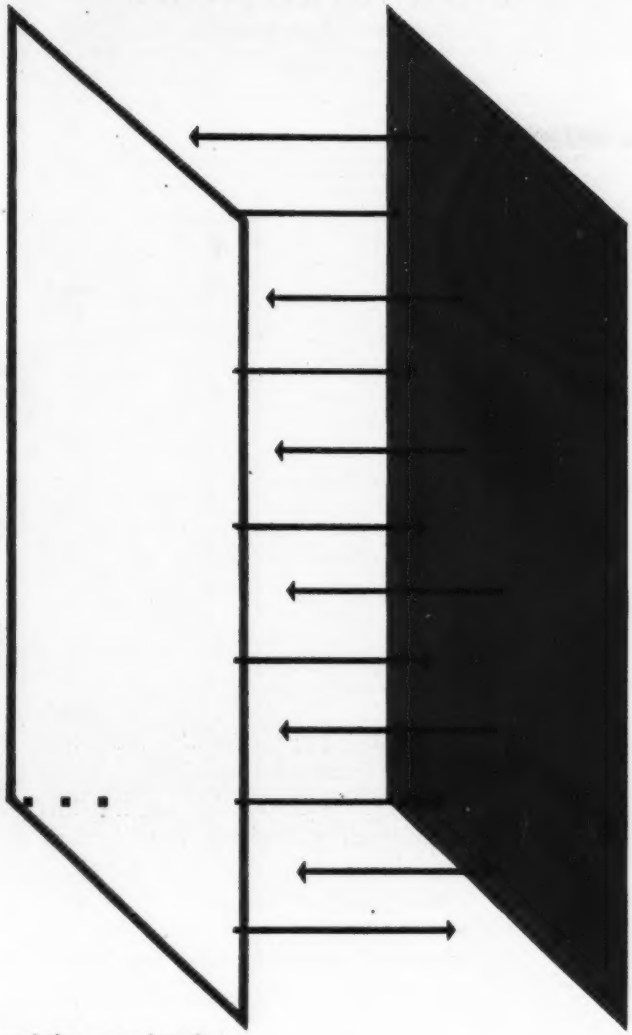

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MONSANTO PLASTICS

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Weeking Ending March 30, 1946

STOCKS

	High	Low	Last
A. P. W.	9⅜	8½	8½
Armstrong Cork Co.	59½	55⅞	59½
Celotex Corp.	28¾	27	28⅛
Celotex Corp., pf.	21⅜	21	21¼
Certain-Teed Products Corp.	19⅜	18⅛	18½
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	50	49½	50
Champion Paper & Fibre Co., pf.	....	....	....
Congoleum Nairn Co.	35¾	34	35½
Container Corp. of America	46	44⅞	46
Continental-Diamond Fibre Co.	16	15⅛	15½
Crown-Zellerbach Co.	36	34⅛	35⅛
Crown-Zellerbach Co., pf.	108	107½	107½
Dixie Cup Co.	48½	43½	48½
Dixie Cup Co.—A	53	52	53
Flintkote Co.	41	37½	41
Flintkote Co., pf.	113	113	113
Robert Gair	11⅛	10⅛	10⅝
Robert Gair, pf.	20⅝	20¼	20½
International Paper Co.	46⅜	45	45⅜
International Paper Co., pf.	118½	117	117
Johns-Manville Corp.	154	152½	153
Johns-Manville Corp., pf.	140	139	139
Kimberly-Clark Corp.	....	....	....
Mac Andrews & Forbes	38¼	37⅛	38¼
Mac Andrews & Forbes, pf.	159	159	159
Masonite Corp.	61¾	60½	61¾
Mead Corp.	26⅜	24¾	25¾
Mead Corp., pf. A—6%	106½	106	106½
Mead Corp. pf. B—5½%	108½	108	108½
National Container Corp.	31¼	27	30½
Paraffine Companies, Inc.	80	78	78
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	26⅜	24⅜	25⅜
Rayonier, Inc., pf.	38⅝	38⅛	38½
Ruberoid Co.	49¾	46¾	48
Scott Paper Co.	60	57	57
Scott Paper Co., pf.	108	107½	107¾
Sutherland Paper Co.	46	43½	46
Union Bag & Paper Corp.	31½	29½	30½
United Paperboard Co.	12⅝	11¾	12
U. S. Gypsum Co.	125	121	121
U. S. Gypsum Co., pf.	204	204	204
West Virginia Pulp & Paper Co.	44⅞	41	44⅞
West Virginia Pulp & Paper Co., pf.	....	....	....

BONDS

Abitibi Pulp & Paper Co. 5s '53	109	108½	109
Celotex Corp. 3¾s '55	....	....	....
Certain-Teed Products Corp. 5½s '53	....	....	....
Champion Paper & Fibre Co. 3s '65	....	....	....
International Paper Co. 5s '47	102¼	102¼	102¼
Mead Corp. 3½s '53	....	....	....

New York Curb Exchange

High, Low and Last for Weeking Ending March 30, 1946

STOCKS

	High	Low	Last
Great Northern Paper Co.	41½	39¼	41
Hummel-Ross Fibre Corp.	13⅝	12½	13½
St. Regis Paper Co.	11⅜	10⅝	11¼
St. Regis Paper Co., pf.	....	....	....
Taggart Corp.	9½	8¾	8¾

BONDS

American Writing Paper Co. 6s '61	....	....	....

H & W Offers 42,000 Shares

BOSTON—One of New England's long-established paper manufacturing companies is issuing securities to the public for the first time in its history with the offering March 27 of 42,000 shares of the Holiingsworth & Whitney Company $4 cumulative preferred stock without par value by an underwriting group headed by Paine, Webber, Jackson & Curtis and Harriman Ripley & Co., Inc. The shares are priced at $105 and accrued dividend from April 1, 1946.

Associated in the underwriting are: Kidder, Peabody & Co.; Stone & Webster Securities Corporation; Estabrook & Co.; Coffin & Burr, Inc., Hornblower & Weeks; Lee Higginson Corporation; R. L. Day & Co. and H. M. Payson & Co.

Kimberly-Clark Profits Up

Kimberly-Clark Corporation, Neenah, Wis., last week reported 1945 net profit of $2,446,599, equal to $3.31 a common share, compared with $2,422,327, or $3.09 a share in the preceding year.

International Preferred Exchange Is High

John H. Hinman, President of Internation Paper Company, stated this week that the call of 100,000 shares of Cumulative Convertible 5% Preferred Stock for redemption on April 4, 1946, was the first step in a program which may result in the retirement of all of the Company's presently outstanding preferred stock, possibly by the end of the year. Mr. Hinman declared that few holders were presenting their called stock for redemption at $105.05½ a share and that the Company now expects that holders of the great majority of the called shares would exercise their right to convert each share of Preferred into 2½ shares of Common, since the latter course is obviously the more profitable with the Common selling around the 45-46 level as it has been recently.

"If the Common continues to sell above the 42 level and the Company continues to issue successive calls for redemption," Mr. Hinman said, "it would not be long before all of the present preferred would be eliminated and most of it would probably be converted into common."

Mr. Hinman said that the Company is now working on a plan under which the present preferred stockholders may later this spring be given an additional option. At the annual meeting to be held May 8, present stockholders will be asked to authorize the issue of 400,000 shares of a new class of Preferred Stock. After the stockholders vote its authorization and if market conditions permit, International Paper Company expects to make a share for share exchange offer to the holders of the present Cumulative Convertible 5% Preferred Stock with the possible addition of some small fraction of Common.

Mr. Hinman expressed the belief that many holders of the present preferred would welcome an opportunity to continue their investment in the Company on a preferred stock basis.

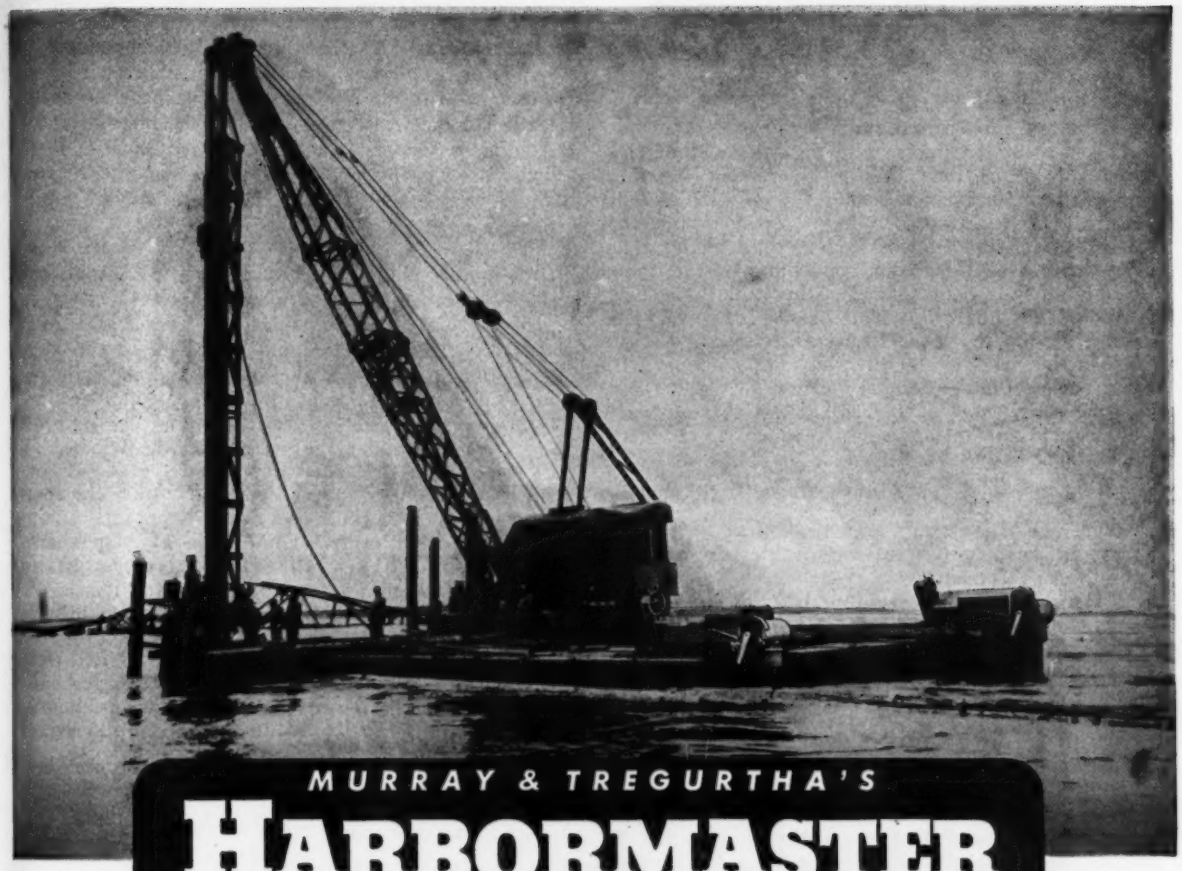
Mr. Hinman pointed out that not only such questions as the dividend rate on the new preferred and whether some fraction of a share of common should be included—but even the question of whether it would be feasible to make any exchange offer—would have to be decided in the light of conditions existing when the offer was made and therefore would have to wait until after the new stock had been authorized by the stockholders.

Eaton Paper Shows 17 Percent Gain

PITTSFIELD, Mass.—In the annual report of the Eaton Paper corporation issued to the company's stockholders, sales for 1945 show a total increase of 10 per cent over 1944 despite shortages of paper and other materials vital to the firm's manufacturing. The net profit in 1945 was 17 per cent over the previous year.

At the recent stockholders meeting all directors were reelected. They are William H. Eaton, chairman of the board; Herbert F. Boynton, who is president of H. F. Boynton & Company, Inc., investments of New York City; Laurence R. Connor, Winthrop M. Crane, Jr., and George P. Clayson. All officers were also reelected. They are Col. Eaton, chairman; Clayton, president; James C. Smith, treasurer and clerk; and George O. Hawley, assistant treasurer.

Employes on the company's payroll now total 621, more than 21 per cent of which have over 25 years of continuous service.



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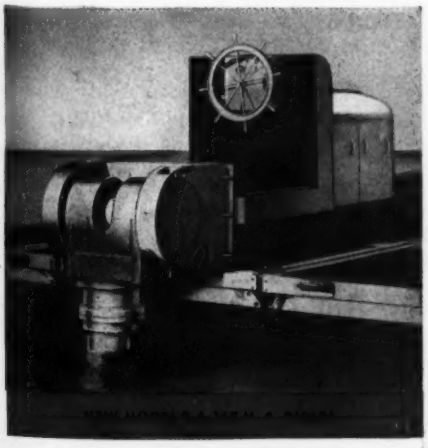

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PAPER TRADE HEARS FACTS OF RECONVERSION

(Continued from page 8)

knows the relation of paper and printing to the success of any kind of program.

"I have no intention of giving you anything less than all of the facts. With Government functions of such importance at stake, I would be derelict in my duty if I failed to follow every avenue that may lead to the desired results. So, frankly, I am not relying solely on your good intentions. I cannot wait until everybody makes up his mind. The Government Printing Office needs paper now. What could I do? I'll tell you. I went before the Civilian Production Administration, which still retains all the war powers of the War Production Board. As soon as the seriousness of the situation was recognized, the Administration agreed to give us its entire cooperation. We have helped to organize a section within the Administration, similar to the war organization, which will devote itself solely to seeing that we get our paper, going even to the length, if necessary, of issuing directives for manufacture of paper for the Government.

"I recognize that these appeals to the industry in emergencies do not constitute a satisfactory long-term arrangement for the Government. The life of the Civilian Production Administration will be limited. Eventually, we will find ourselves in the position of being without power to direct that the Government be furnished the needed paper. Eventually, also, the Government's needs will become routine, and the emergency argument will lose its force. It is possible that when that time comes, commercial accounts may, for whatever reason, still be more attractive than Government business. So what then?

"Well, the Government Printing Office has been considering whether it should follow the example of other publishers and acquire its own mills, thus relieving the industry of the necessity of supplying the Government's admittedly uncertain and variable volume. If we should build up such an assured source of supply, the burden on the industry would be greatly reduced and we would need to come to you only for specialties. I am not at all sure that this is the right answer. If we should ever again have an emergency like that of 1941 to 1946, even our own mills would not be adequate for all our needs, unless we built for a maximum output that would not normally be required. I think it could be worked out. For example, in normal years we could make paper for all Government use—blank paper, specialty forms, wrapping stock, and so on. In times of critical supply we could withdraw into the more limited field of printing papers, perhaps make only book papers. In considering the whole problem, I should like you to think of this angle also and let me know your conclusions. I do not believe that the Government should get into the paper business without the advice of those who know the workings of the whole industry.

"I urge you, as earnestly as I know how, to consider the problem and to use whatever influence you have with the mills you represent to see that Government needs are met. After all, this condition is not one that will continue forever. The time is probably not so far off when Government business will be sought as eagerly as it ever was. In the meantime, would it not be the part of wisdom to avoid the necessity for measures which might delay a return of the industry to normal operation?"

OPA Revises Board Price

WASHINGTON — Manufacturers' dollar-and-cent ceiling prices already established for paperboard produced east of the Rocky Mountains have been extended to the west coast area by the Office of Price Administration. This action, effective April 1, 1946, will cause varying increases for most paperboard produced west of the Rockies, although on one grade there will be a slight reduction.

The changes will not be reflected in price ceilings for products made from paperboard, OPA said.

Heretofore, west coast producers were "frozen" to their March 1942 levels under the General Maximum Price Regulation. OPA said there will be considerable advantage to both the agency and the industry in having one regulation applicable to all manufacturers.

At the same time, the present ceiling price of 78 cents per thousand square feet for one grade of corrugating medium paperboard known as chestnut, 9/100 of an inch thick, is raised to 86 cents, an increase of eight cents. This grade of paperboard, which is produced east of the Rockies only, has shown a steady drop in production, and the action is designed to induce manufacturers to now make more of this grade.

Simultaneously with these changes, which were concurred in by the industry, the entire paperboard regulation has been revised and will now be known as Maximum Price Regulation 32 instead of Revised Price Schedule 32.

Keith Campbell Leaves the Army

Capt. Keith S. Campbell, formerly advertising manager of the Swigart Paper Co., Chicago, has been relieved from active duty and will go on terminal leave until he receives his discharge when he will again resume his post with the Swigart Co.

A graduate of the University of Minnesota in 1936, Capt. Campbell entered the Army as an enlisted man in January 1942, and was assigned to Barksdale Field, La., Midland Field, Texas, and the Army Air Base at Muroc, California. Later he attended Officer Candidate School at Camp Lee, Va., from which he was graduated with the commission of second lieutenant. He was then assigned to the Jersey City Quartermaster Depot (N.J.) and was promoted to first lieutenant in April 1943. He attained his captaincy in August of 1944. He served at that military installation until March of this year when he was transferred to the Quartermaster Purchasing Office, New York City, as Officer in Charge of the Paper and Forest Products Section.

Fisher and Old Join Little

CAMBRIDGE, Mass.—Dr. Austin W. Fisher and Dr. Bruce S. Old have joined the staff of Arthur D. Little, Inc., industrial research organization. Dr. Fisher, a graduate of Massachusetts Institute of Technology and of Massachusetts State College, was formerly with the Barrett Division of Allied Chemical and Dye Corp. and with the Publicker Industries, Inc. He will supervise chemical engineering research. Dr. Old was graduated from the University of North Carolina and from M.I.T. He was previously with Bethlehem Steel Co. and, as Commander, USNR, was associated with wartime technical development for the Navy. He will now engage in metallurgical research.

RUBBER PLANTATION—AMERICAN STYLE

The only three butyl rubber plants in existence . . . those at Baton Rouge, Louisiana; Baytown, Texas; and Sarnia, Ontario . . . were engineered and built by Stone & Webster Engineering Corporation. In view of the many specialists required for each plant's design, erection and ultimate operation, we also acted as the coordinating agency.

Pictured above, unit #2, butyl rubber plant, Baton Rouge, Louisiana, operated by Standard Oil of New Jersey (Louisiana Division). Largest and first to go into operation; design capacity is 33,000 long tons of butyl rubber per year.

STONE & WEBSTER ENGINEERING CORPORATION

A SUBSIDIARY OF STONE & WEBSTER, INC.

St. Lawrence Group Reports Profits

MONTREAL, Que.—The annual reports of the St. Lawrence Corporation's group of pulp and paper mills are now available. These comprise St. Lawrence Paper Mills Company, Brompton Pulp and Paper Company and Lake St. John Power and Paper Company, the Corporation holding 99.2% of the common shares of the first-named, which in turn owns all of the preferred and 84% of the common of Lake St. John Paper. Of the Brompton shares the Corporation holds 99.6%.

St. Lawrence Paper Mills Company Limited reports net profit of $431,460 for the year ended December 31, 1945, after provision of $186,912 for taxes. This compares with net profit in 1944 of $430,571 after taxes of $228,978.

Operating profit was $1,001,925 against $1,140,180, and dividends on Lake St. John shares totalled $274,185 against $216,000. Net working capital rose from $4,137,231 to $4,229,022.

Above net profits are equal to $3.39 per share of preferred stock in 1945 against $3.31 in 1944. Dividend payments on the preferred totalled $3.00 per share in each year. Earned surplus was increased from $575,200 to $615,361.

J. I. Rankin, president, states capital expenditures amounted to $153,306 in 1945, and a further sum of $175,000 was spent on purchase of a freehold limit in the Gaspe district.

Brompton Pulp & Paper Company Limited and wholly-owned subsidiary, Dominion Lime Limited, report consolidated net profit of $307,646 or $1.02 per share for the year ended December 31, 1945, against $309,752 or $1.03 per share in 1944. Above profits are after providing $275,813 for taxes in 1945 against $256,468 in 1944, and $255,037 for depreciation against $405,885. Dividends of $1 a share were paid in each year, requiring $300,000. Surplus was increased in 1945 by $7,636 to $644,061.

Arthur F. White, president, states an issue of $3,500,000 of five-year 3½% notes, due 1950, was sold during the year. Additions to plant and equipment in the East Angus division amounted to $117,783.

By the end of the year, Mr. White states, construction was substantially completed at the Red Rock mill and total expenditures and commitments involved amounted to $6,436,010, including the $1,000,000 originally paid for the property. The mill was ready for operation in January. Next expenditures on improvements and equipment for development of timber limits at the Red Rock Division amounted to $633,822.

Referring to a fire in October causing a loss of 33,000 cords of pulpwood at East Angus, Mr. White states that, although the company was fully covered by insurance, replacement of this pulpwood will be difficult and may cause a period of shutdown during 1946. A reserve of $412,559 was set up in this connection.

Lake St. John Power & Paper Company Limited reports net profit of $310,898 for the year ended December 31, 1945, equal to $2.02 per common share. This compares with 1944 net of $308,770 or $2.01 per common share. Operating profits were $1,503,064 against $1,526,702. Tax provision was $207,266 against $200,962. J. I. Rankin, president, states that notes of the Hearst Companies, which amounted to $632,188 at the end of 1944, were reduced to $314,749 and are now shown under current assets. During the year $850,400 of the company's 5½% bonds and $147,900 of 5% debentures were redeemed and cancelled. Funded debt left was $6,999,600. Capital expenditures amounted to $150,000.

St. Lawrence Corporation Limited reports net income of $286,758 in 1945 against $282,048 in 1944. Dividends on the "A" shares absorbed $263,600 against $263,395.

In a memorandum accompanying the report, A. K. Cameron, president, states that Brompton earnings are practically all available to St. Lawrence Corporation. In 1945, dividends from this source were equal to $1.13 for each Class "A" share of St. Lawrence Corp., but the "A" shares are entitled to $2 cumulative dividend "so that no earnings were available for the common stock of your corporation." He adds that arrears on the "A" shares of $19 per share now amount to $5,016,532, "which must be satisfied before dividends can be paid on the common stock."

Earnings of St. Lawrence Paper, the memorandum continues, must first be applied to the payment of dividends on the preferred shares of that company, of which there are 127,410 outstanding. Dividends of $3 per share were paid in 1945, but the holders are entitled to cumulative dividends of $6 per share "and, accordingly, cumulative arrears were increased and now amount to $69.50 per share or a total of $8,854,995.

GPO to Get Surplus Paper

WASHINGTON — Existing surpluses of paper and paper products, approximating $5,000,000 cost to buy, will be sold in large quantities to the Government Printing Office, the Surplus Property Administration reported to Congress last week, covering fourth quarter, 1945, operations.

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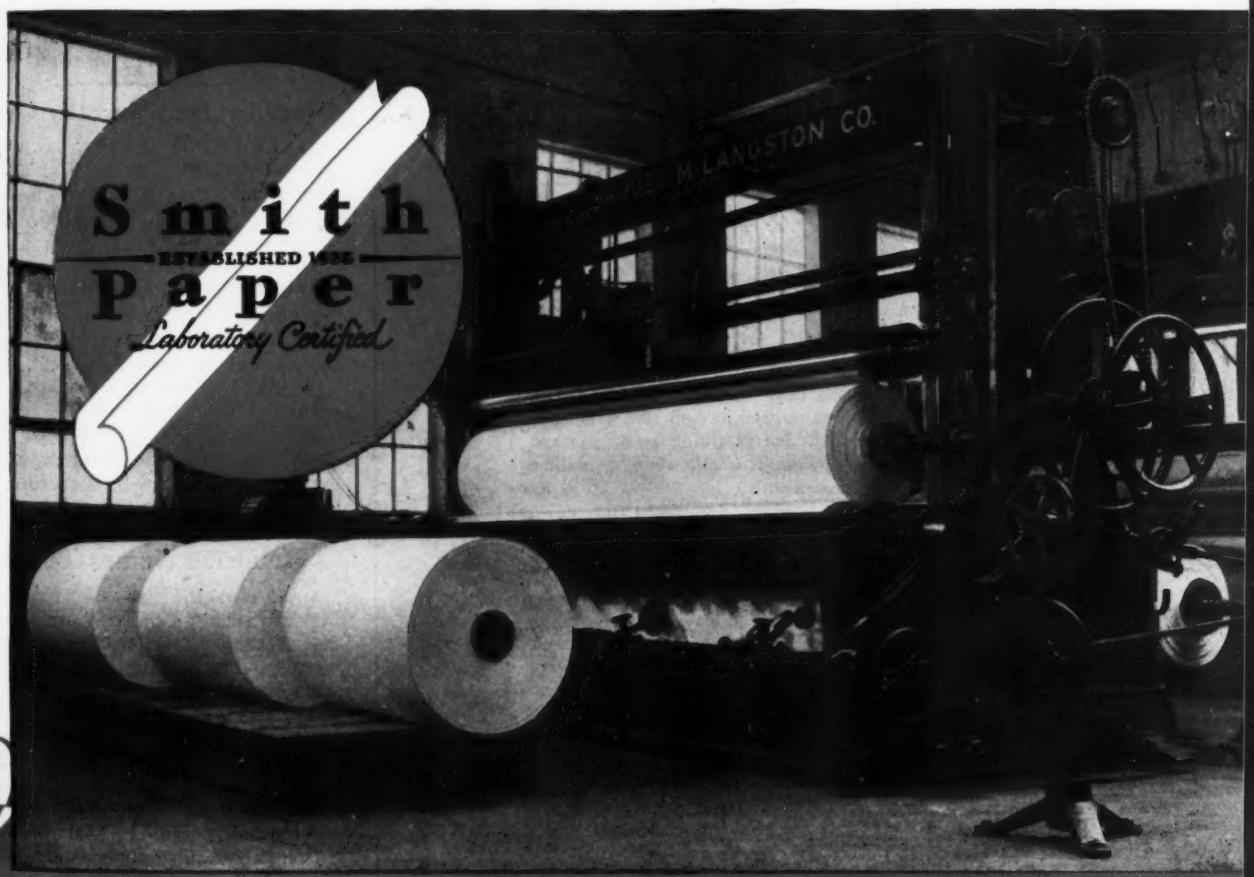

Langston

SLITTERS AND ROLL WINDERS

Oppose Scott Pier Plans

PHILADELPHIA — The proposed plans of Scott Paper Company for a large pier at its Chester plant, to accommodate ocean cargo vessels are to be opposed by the Wilson Line, operators of summer excursion steamers. A public hearing on the Scott Company's plans was held on Wednesday last in the Bourse Building, Philadelphia by the Pennsylvania Department of Forests and Waters and the Navigation Commission for the Delaware River.

The proposed new pier would be built out to the pier head line, a distance of some 300 feet beyond the present Scott bulkhead, at the foot of Welsh street. The Wilson Line which leased the Market Street wharf from the City of Chester at an annual rental of $1,000, is said to contend that the new pier will interfere with the docking of the river steamers, which operate during the summer months.

The Scott plant rises from the building line on the east side of market street, and the company also owns the property on the west side of Market street, where it is planned to build a new million dollar power plant. Ever since the Scott plant was built in Chester in 1910, pulp and materials have been delivered to the company in small vessels and lighters, which tie up on the east side of Market street wharf.

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Hercules Moves Personnel

HOLYOKE, Mass.—Henry L. Mellen has been promoted to be assistant resident manager of the Willimansett plant of the Hercules Powder Company.

Thomas L. Stirling of New York and formerly of Holyoke returns to the Willimansett division in a sales capacity. He was here before the war and after nearly four years of service with the navy resumed his association with Hercules in the New York office of the Industrial Chemical division. He was discharged from the navy with the rank of lieutenant-commander. He is now being transferred from the Industrial Chemical division to the Paper Chemical division of which the Willimansett plant is a unit.

M. C. Davitt is being transferred from Wilmington, Del., to this city as technical supervisor, Kent announced. L. E. MacKenzie has been transferred from the Industrial Chemical division in Boston to the post held by Stirling in New York.

Harving Incorporates Firm

As of April 1, the Harving Paper Company, which has been operating successfully over a period of many years in paper exporting, has been incorporated under the laws of the State of New York. The Corporation begins operations with increased personnel, a large back-log of orders, as well as additional lines under exclusive export sales representations.

Frank W. Poyntz has been appointed Office Manager of the new Corporation. Mr. Poyntz has had many years' experience in the paper export field, and will, therefore, be a valuable asset to the corporation.

Hendrick Names Three

CARBONDALE, Pa. — Hendrick Manufacturing Company, producers of perforated metals and open steel flooring, has appointed three new sales representatives. Henry H. Rugg, St. Paul, will cover Minnesota, the Dakotas, and northwestern Wisconsin; Charles H. Dishman, Kansas City, Mo., will handle Kansas, Oklahoma and western Missouri; and Crandall-Ricker Sales Corp., St. Louis, for eastern Missouri, Arkansas, western Tennessee, western Kentucky, and a portion of southwestern Illinois.

TIN LIZZIE IS NO PUDDLE JUMPER

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PAPER
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W. L. Cook, Editor

HELP WANTED—AND NEEDED

Two speakers before the National Paper Trade Association convention this week at New York's Waldorf Astoria laid emphasis on a subject that too many have felt for too long a period should be avoided. That subject was the proper cooperative interest of industry in government and the form that it might take—must take—if the benefits of industry's know-how are to be developed to their fullest values. Each speaker talked from a different background but with an intimate knowledge of the other side of the picture that is unfolding as history is being written. Owen Brewster, United States Senator from Maine, spoke as a government figure who knows much about the paper industry—his state, aside from its summer tourists and vacation-seekers, derives a substantial part of its revenues from pulpwood and paper. That interest in affairs back home which every alert elective government official possesses, has made him acutely conscious of the pulp industry's welfare. Grant Richardson, of the Hammermill Paper Company, reaching his conclusions from an industrial viewpoint, talked to the paper dealers about Washington and its Bureaus as one who has enjoyed his first-hand opportunity to learn about them from his own experience. He was formerly director of the Paper Division of the War Production Board. Both agreed that the time has arrived when all business must make its voice heard more frequently at Washington. Business men, said the Senator, must pay more attention to Politics or, soon, there won't be any business. It is not only possible that mistakes can be made; it is even probable that, due to pressure, they may be made, unless interested industry presents its own, and sometimes, differing side of the problems.

While the Senator was talking as one who makes the laws Richardson's factual advice was based on his intimate knowledge of the ways of those who sometimes influence the laws and make their own rules—the bureaucrats. The same observation which helped him discover and trace for his hearers the dangers through which industry has been led step by step must give weight to his advice that alleviation can be sought, and further evils avoided, through intelligent persistent action by industry, Mr. Richardson is speaking:

The laws of economics like the laws of nature cannot be violated nor restrained without penalty. Industry by and large knows this and obeys the laws.

As WPB controls over our industry were removed one by one last year there were those who predicted dire disaster would surely follow. The first control to be discarded was revoked shortly after V-E day. It was revoked for one simple reason: It had served its war purpose and any further effort to hold onto it would have implied a desire to convert a war control into something never intended when it was written, namely a means of continuing socialized authority beyond the limits of war production.

There is much talk now of the revival of the controls of production, distribution and consumption. Difficulties which arise as the result of one type of controls cannot be cured by additional controls. Unnecessary shortages which might result from the mishandling of wage and price controls are not remedied by setting up new controls.

It seems reasonable to assume that if new peacetime controls were now to be placed over the paper industry and the paper trade, even if sugar-coated by being referred to as modified and temporary controls, those controls in one form or another would be with us for a long time to come. We should understand this before any of us carelessly expresses a wish for the return of some of the controls which in wartime properly, but nevertheless artificially, eased our difficulties, but which do not belong today.

The war is over. The argument that controls were needed during the war is a flawless argument but that argument no longer obtains. Now the advocates of government controls use as their justification the crisis of reconversion. When that excuse has exhausted its usefulness there will be another crisis to tie to, and another, and another, unless American business leaders protest at last that they are willing to take the hard risks of freedom in their stride and discard the habit of looking to Washington for help and express their willingness to stand on their own feet once more.

In what way, you ask, can our influence be put to constructive use in Washington in time of peace? If a system of free enterprise is the best atmosphere in which to build an expanding and a profit-producing business, cultivate such a system. Convince government officials, not by lip service, but by action, that new controls are not needed.

Do not rest on the mere criticism of government sponsored cure-alls, but apply time and effort to finding a remedy in the atmosphere of free enterprise.

More often than otherwise the remedy will be voluntary sacrifice. It may be a minor sacrifice for a short period of time, or it may be something more than that as the price of avoiding government control, but it will be worth it.

Calendar of Coming Events

June 17-20, 1946.—American Pulp and Paper Mill Superintendents Association, Annual Convention, Poland Springs, Me.

Illick Takes Sabbatical Leave

SYRACUSE, N. Y.—The executive committee of the Board of Trustees of the New York State College of Forestry has granted six-month sabbatical leaves to Dean Joseph S. Illick and Associate Professors Svend O. Heiberg and Frederic W. O'Neil. Dean Illick plans to visit professional schools of forestry on the West Coast and in the South and to make a special study of administrative set-ups in forestry educational institutions. He also is planning to work toward the completion of a textbook on forest administration.

Svend O. Heiberg, associate professor of silviculture, will leave August 1 for Scandinavia. He will study new silvicultural practices in Scandinavian countries and will lecture on economic cutting practices before forest schools and forest societies in Denmark and Sweden.

Frederic W. O'Neil, associate professor of pulp and paper manufacture, will devote his sabbatical leave to the completion of the course work for a doctor's degree.

Yale Offers D. For. Degree

NEW HAVEN, Conn.—Dean George A. Garratt of the Yale University School of Forestry has disclosed that the School's curriculum will be expanded with the opening of the fall term next September 16 to include work leading to the advanced degree of Doctor of Forestry. By this action, Yale will become the second university in the nation to offer work leading to this degree. At the present time, Duke University is the only institution in the country which grants the D. For. degree.

Work for this degree, Dean Garratt stated, will parallel in "intensity of training and in technical achievement" that required for the Ph.D. degree, for which foresters currently enrolled in the Yale Graduate School may become candidates.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1946		Corresponding Weeks—1945	
Feb. 16	95.0	Feb. 17	91.0
Feb. 23	98.0	Feb. 24	89.7
March 2	101.8	March 3	89.3
March 9	103.4	March 10	87.7
March 16	104.1	March 17	89.4
March 23	*105.0*	March 24	92.1

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1945	86.7	89.4	90.2	88.1	89.8	91.2	80.8	88.6	90.2	95.9	95.5	91.0	89.7
1946	94.7	*98.4*											

COMPARATIVE YEARLY SUMMARIES

	1939	1940	1941	1942	1943	1944	1945	1946
Year to Date..	79.4	85.9	88.9	103.7	88.6	88.6	88.2	*98.1*
Year Average..	83.4	85.6	97.4	90.4	87.8	88.1	89.7	

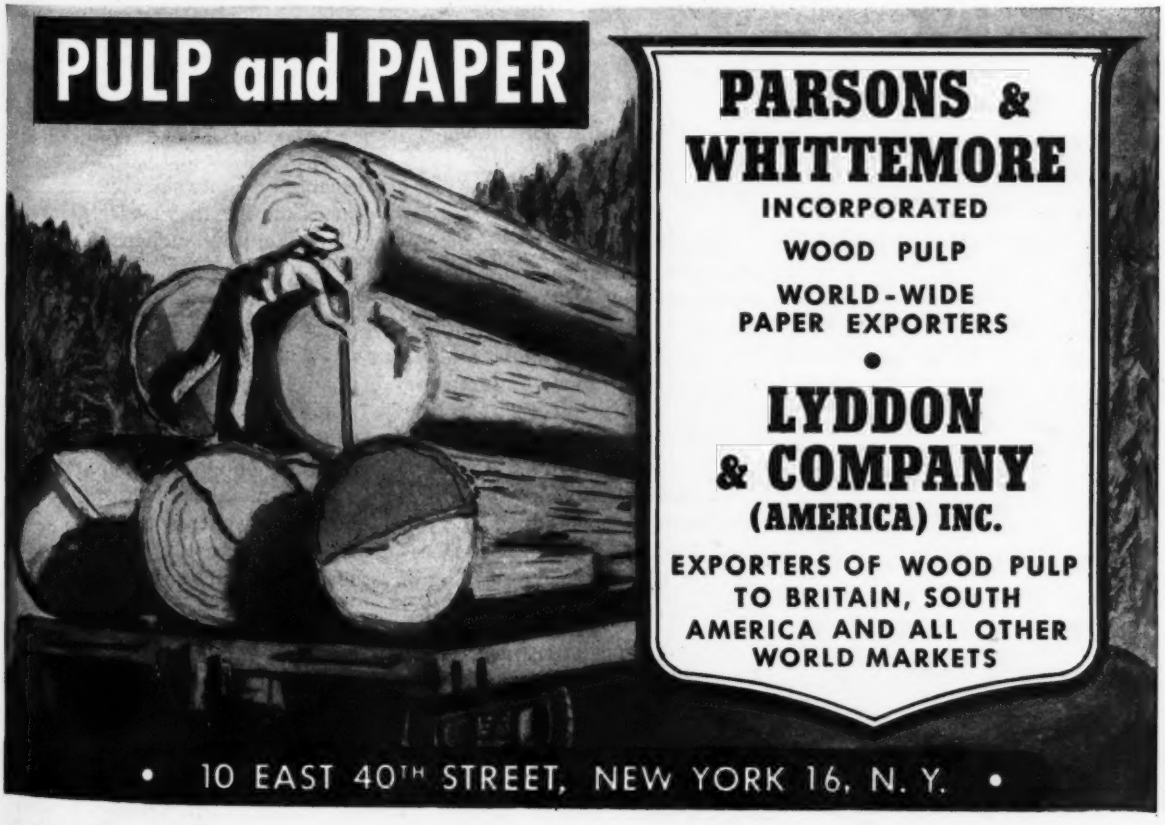
PAPERBOARD OPERATING RATIOS†

Current Weeks—1946		Corresponding Weeks—1945	
Feb. 16	94	Feb. 17	93
Feb. 23	97	Feb. 24	97
March 2	98	March 3	96
March 9	99	March 10	94
March 16	100	March 17	95
March 23	99	March 24	99

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1945	91	95	97	97	96	96	86	90	91	97	95	85	93
1946	90	97											

*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.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122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Lignin-Filled, Laminated-Paper Plastics

A cooperative report of the U. S. Forest Products Laboratory*, the Howard Smith Paper Mills, Ltd., Cornwall, Canada, the Canadian Department of Munitions and Supply, and the Forest Products Laboratories of Ottawa, Canada.

A new approach for the utilization of lignin in the production of a strong laminated paper plastic was indicated by the results of preliminary work conducted by the Howard Smith Paper Mills, Ltd. of Cornwall, Canada. At the instigation of the Canadian Department of Munitions and Supply, a further investigation was conducted as a cooperative project at the U. S. Forest Products Laboratory. This investigation was directed primarily towards the establishment, on pilot plant scale, of the most suitable procedure for handling and controlling the various operations involved, incorporation of desirable properties in the laminate, and the evaluation of the product for various war uses.

In the course of this investigation it was found that, with the exception of edge compressive strength a high temperature thermoplastic lignin-filled paper laminate of equal or superior strength to the conventional phenolic laminates can be made.

Of special interest is its exceptionally high resistance to impact, which may be considered as a measure of toughness. Comparison with recently published test data by the Army Air Forces, Materiel Center, on fabric- and paper-base phenolic laminates indicates that the lignin-filled paper laminates have face Izod impact values three to six times greater than the other types. The edge impact values are approximately equal to those of fabric-base laminates and three times greater than those of the conventional paper-base laminates. Both face and edge impact values are two to three times greater than corresponding values for papreg (a high-strength phenolic laminate), although other strength properties thus far obtained are somewhat less.

Although lignin is thermoplastic it has been found that the loss in tensile strength obtained when lignin-filled laminates are heated to 200° F. is not greater than that for thermosetting phenolic papreg. At low temperatures the tensile strength of the lignin-filled laminate improves slightly over that measured at room temperature. There is some loss in impact strength both at high (200° F.) and at low (subzero) temperatures, but even at these temperatures the strength of the plastic compares favorably with that of other materials of this type even when they are measured under their most favorable temperature conditions.

In addition to the use of lignin as a filler in laminating paper for plastics, it has been found that it can be used as an extender for phenolic resins in impregnating varnishes for paper laminates *(1)*.

Manufacture of Lignin-Filled Paper Laminates

The process for manufacturing lignin-filled paper laminates comprises the following four steps: *(1)* Isolation of lignin from the spent liquors of the alkaline pulping processes; *(2)* incorporation of the lignin in a papermaking furnish; *(3)* production of a moldable paper; and *(4)* conversion of the lignin-filled paper into a laminated plastic.

The lignin supplied by Howard Smith Paper Mills, Ltd., was produced from aspen wood soda-pulp black liquor in a pilot plant. The investigations conducted at the U. S. Forest Products Laboratory were concerned exclusively with the three remaining steps in the process.

Several schemes for incorporating the lignin with the pulp prior to its manufacture into paper were studied, two of which were reduced to practical and readily controllable procedures. One of these methods consists of mixing the pulp with an aqueous solution of the crude lignin and then precipitating the lignin in a water-insoluble form of suitable particle size and physical characteristics by means of dilute sulphuric acid. A temperature of 203° F. (95° C.) and a pH of 3.0 was suitable for precipitation. The equipment used for this operation was a wood tank with a draft tube and centrally placed impeller to allow thorough mixing and agitation. Following the precipitation, the stock was washed by passing the mixture over a rotary vacuum filter to remove impurities which would cause excessive foaming on the paper machine. The excessive acid was neutralized with lime, to permit the use of a standard iron filter with iron auxiliary equipment.

The second method consists of precipitating the lignin directly from its solution, in the absence of the pulp, but obtaining the lignin in a physical condition similar to that obtained by the first method. By this procedure a finely divided purified lignin in the form of a paste or powder can be produced. In this form, lignin becomes available not only for use as filler in the paper furnish, but also as a coating material for augmenting the lignin content at the surface of the lignin-filled sheet. It is also in suitable form for use as an extender for phenolics in varnishes for impregnated-paper laminates. In most experiments of this type the pulp was added directly to the lignin without separating the lignin from the mother liquor. The resultant mixtures were washed

* Maintained at Madison, Wis., in cooperation with the University of Wisconsin.

TABLE I.—PHYSICAL AND MECHANICAL PROPERTIES OF LIGNIN-FILLED, LAMINATED-PAPER PLASTIC FROM RUN 37[1] (PLASTIC NOS. 2237, 2238, AND 2239)

Panel number	Thickness,[2] in.	Specific gravity	Conditioning procedure before testing	Moisture content of paper at time of lamination (moisture-free basis), %	Tensile Strength: Ultimate, lb. per sq. in.	Tensile Strength: Proportional limit, lb. per sq. in.	Tensile Strength: Modulus of elasticity, 1,000 lb. per sq. in.	Edge Compressive Strength: Ultimate, lb. per sq. in.	Edge Compressive Strength: Proportional limit, lb. per sq. in.	Edge Compressive Strength: Modulus of elasticity, 1,000 lb. per sq. in.	Flexural Strength: Modulus of rupture, lb. per sq. in.	Flexural Strength: Proportional limit, lb. per sq. in.	Flexural Strength: Modulus of elasticity, 1,000 lb. per sq. in.	Water Absorption—24 Hours: Weight increase, %	Dimensional Change: Length, %	Dimensional Change: Width, %	Dimensional Change: Thickness, %	Forest Products Laboratory toughness, in.lb. per in. width	Rockwell hardness, 10 + 100 kg., M scale	Shear (Johnson): Flatwise,[3] lb. per sq. in.	Shear (Johnson): Edgewise,[4] lb. per sq. in.	Bearing strength (⅛ in. dia. pin) at 4% deformation of hole diameter, lb. per sq. in.
Section 1—Parallel laminated—tested parallel to fiber direction (grain)																						
2239-A	0.135	1.39	75° F.—50% R.H.	7.7	28,520	7,160	2,513	13,680	3,770	2,320	27,130	9,000	2,306	5.2	0.00	0.40	4.12	46.0	76.2	11,290	.....	[5]13,445
2239-Q	.130	...	Heated at 158° F..	..	20,080	5,250	2,647	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
2239-Q	.129	...	Heated at 200° F.	..	19,477	6,440	2,633	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
2239-D	.489	...	Cooled at —68° F.	7.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	10,790	.....
2238-K	.132	1.38	75° F.—50% R.H.	7.5	24,500	5,940	2,317	12,610	3,447	2,147	25,470	9,640	1,909	5.5	...	...	...	49.2	...	.....	.....	.....
2238-I	.125	...	75° F.—50% R.H.	..	25,600	7,430	2,067	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
2238-I	.125	...	Packed in dry ice	..	27,100	8,500	2,894	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	14,427
[6]2237-G	.499	...	75° F.—50% R.H.	..	.....	....	....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
[6]2237-G	.509	...	Heated at 200° F..	5.9	.....	....	....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
Section 2—Parallel laminated—tested perpendicular to fiber direction (grain)																						
2239-E	.129	1.40	75° F.—50% R.H.	7.1	8,730	2,690	927	11,620	1,630	953	12,240	4,280	950	5.3	0.16	0.15	4.32	44.2	77.6	.....	.....	.....
2239-Q	.134	...	Heated at 158° F..	..	6,455	2,400	960	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
2239-D	.486	...	Cooled at —68° F.	7.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	13,850	.....
2238-L	.119	1.37	75° F.—50% R.H.	7.5	8,560	2,960	918	11,250	2,280	818	11,960	5,030	869	..	...	...	...	45.5	...	.....	.....	.....
2238-I	.125	...	Packed in dry ice	..	10,020	3,630	1,102	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
[6]2237-G	.503	...	75° F.—50% R.H.	5.9	.....	....	....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
[6]2237-G	.508	...	Cooled at —68° F.	5.9	.....	....	....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
Section 3—Cross laminated																						
2239-F	.126	1.39	75° F.—50% R.H.	7.5	16,770	4,050	1,793	13,110	2,460	1,694	20,000	5,720	1,673	5.3	0.00	0.20	4.42	31.8	88.2	11,530	.....	13,845
2239-G	.106	...	Heated at 158° F..	..	14,770	4,260	1,772	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
2239-P	.490	...	Heated at 200° F..	7.1	.....	....	....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
2239-P	.492	...	Cooled at —68° F.	7.1	.....	....	....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	.....	.....	.....
2238-J	.129	1.39	75° F.—50% R.H.	7.5	15,190	4,080	1,658	9,830	2,295	1,340	19,335	6,100	1,353	5.7	...	...	...	20.6	...	.....	.....	.....

Panel number	Impact Strength (Izod): On Notched Specimens: Panel thickness before notching, inch	Flatwise,[3] ft.lb. per in. of notch	Edgewise,[4] ft.lb. per in. of notch	On Unnotched Specimens: Flatwise, ft.lb. per in. of width	Edgewise, ft.lb. per in. of width
2239-D	0.489	12.82	1.82	....	....
2239-D	.489	10.47	1.87	....	....
2239-D	.489	9.76	1.41	....	....
2237-G	.499	....	1.63	16.40	11.59
2237-G	.509	....	1.81	....	....
2239-D	.494	[7]13.10	1.65	....	....
[7]2239-D	.488	11.82	1.51	....	....
2239-D	.486	3.20	0.99	....	....
2237-G	.503	12.90	1.56	....	10.04
2237-G	.508	2.97	0.85	....	....
2239-P	.490	8.51	1.59	....	....
2239-P	.490	6.87	1.05	..	..
2239-P	.492	6.34	0.98	..	..

[1] Run 37—Forest Products Laboratory experimental black spruce sulphate pulp; cooks 2644 and 2645 combined. Content of added lignin—43.2%. Lignin-filled pulp from run 2239 was jordaned, whereas runs 2237 and 2238 were not jordaned. Laminating and testing conditions: Temperature, 356° F.; pressure, 500 p.s.i.; time, 10 minutes for ⅛-inch thickness, 20 minutes for ½-inch thickness; panels cooled before release of pressure. The preparation, conditioning, and testing of specimens conforms to the Federal Specification for Plastics, Organic; General Specifications (Methods of Tests) L-P-406, Dec. 9, 1942.

[2] Thickness of laminated plastic (in molding pressure direction).

[3] Load applied to the flatside of the original material (parallel to the direction of molding pressure).

[4] Load applied to the edge of the original material (perpendicular to the direction of molding pressure).

[5] Specimens from panel 2239-E.

[6] Lignin-filled paper coated with additional lignin on paper machine, thus increasing lignin content to 45.0%.

[7] Specimens conditioned at 200° F.

TABLE III.—SIMPLIFIED[1] SUMMARY OF DATA ON LIGNIN-FILLED LAMINATED-PAPER PLASTICS, PARALLEL LAMINATED, ALL TESTS MADE IN DIRECTION OF GRAIN

Pulp	Lignin added, %	Laminating pressure, lb. per sq. in.	Specific gravity	Tensile Strength: Ultimate, lb. per sq. in.	Tensile Strength: Modulus of elasticity, 1,000 lb. per sq. in.	Edge Compressive Strength: Maximum, lb. per sq. in.	Edge Compressive Strength: Modulus of elasticity, 1,000 lb. per sq. in.	Flexural Strength: Modulus of rupture, lb. per sq. in.	Flexural Strength: Modulus of elasticity, 1,000 lb. per sq. in.	Water Absorption—24 Hours: Weight increases, %	Dimensional Change: Length, %	Dimensional Change: Width, %	Dimensional Change: Thickness, %	Forest Products Laboratory toughness, in.-lb. per in. width	Izod Impact: Flatwise, in.-lb. per in. notch	Izod Impact: Edgewise, in.-lb. per in. notch	Rockwell hardness, M scale	Shear (Johnson): Flatwise, lb. per sq. in.	Shear (Johnson): Edgewise, lb. per sq. in.	Bearing strength (⅛-in. diameter pin) at 4% deformation of hole diameter, lb. per sq. in.
Commercial bleachable A[2]	34.8	750	1.40	24,000	2,300	13,000	2,300	26,000	2,300	5.9	0.00	0.50	4.91	36	9.8	1.4	92			
Commercial bleachable A[2]	34.8	1,500	1.43	22,000	2,250	15,000	1,800	27,000	2,100	6.6				38						
Commercial bleachable A[2]	37.9	1,500	1.43	20,000	2,400	16,000	2,100	28,000	2,100	4.5				31						
Commercial bleachable A[2]	37.9	500	1.36	18,000	2,000	14,000	1,800	23,000	1,800	5.7				30						
Commercial bleachable A[2]	43.6	750	1.40	20,000	1,900	13,000	1,900	24,000	1,900	5.3	0.00	0.35	3.11	30	6.4	1.2		10		
Commercial bleachable A[2]	43.6	500	1.38	18,000	2,000	13,000	1,800	22,000	1,700	5.0				29						
Commercial bleachable A[2]	47.0	750	1.39	19,000	1,900	12,000	1,900	23,000	1,900	4.6	0.00	0.40	3.27	30	[4] 10.4	[4] 1.3	92			15
Commercial bleachable A[2]	47.0	750	1.41	24,000	2,400	13,000	2,700	24,000	2,200	5.5				41						
Commercial bleachable B[2]	37.0	1,000	1.43	23,000	2,500	14,000	2,200	25,000	2,100	5.0				39						
Experimental laminating, U. S. Forest Products Laboratory	43.2	500	1.39	29,000	2,500	14,000	2,300	27,000	2,300	5.2	0.00	0.40	4.12	46	12.8	1.8	78	11	11	13
Experimental laminating, U. S. Forest Products Laboratory	43.2	1,000	1.41	28,000	2,700	13,000	2,400	27,000	2,400	4.8	...	...	...	45	...	...	...	...	...	...

[1] For complete data, see Table II.
[2] Commercial bleachable sulphate pulp obtained from a Wisconsin mill.
[3] Commercial bleachable sulphate pulp obtained from a Quebec mill.
[4] Izod values taken from panel 2229-J, 38.6% lignin (no similar data available on 2230-C, 37.0% lignin).

on the rotary filter. In commercial production it should be possible to separate and wash the lignin in the absence of the pulp, thus producing purified lignin for mixing directly with the pulp in the paper mill beater.

The laminating paper was made on the Laboratory papermaking equipment. The pulp-lignin furnish prepared by either of the methods described was run to the paper machine in the usual manner. No unusual papermaking problems were encountered except those involving retention of the lignin in the paper. Relatively simple methods gave essentially complete retention of the lignin at all stages of the process. These methods were selective return of the white water and the use of glue and alum as flocculating agents. The results obtained indicate that the standard commercial fourdrinier machine, with only minor adjustments, is entirely suitable for the manufacture of this type of paper.

It was demonstrated that lignin-filled papers thus prepared can be laminated between open cauls, using moderate laminating pressures and a temperature (356°F.) normally available at the paper mill steam plant. It is necessary to cool the panel before removing it from the press. The pressures required for laminating are dependent on the lignin and moisture contents of the sheet.

Influence of Process Variables on the Physical Properties of the Paper Laminate

In order to establish, and where possible enhance, the physical properties that may be obtained in a lignin-filled laminate, six process variables were studied: *(1)* Lignin filler content; *(2)* type of sulphate pulp used; *(3)* use of lignin as a surface coating on the lignin-filled paper; *(4)* orientation of paper in lamination; *(5)* laminating pressure and *(6)* the use of special surface sheets to improve the resistance of lignin-filled laminates to water absorption.

The physical properties of a laminate pressed at 500 p. s. i. and 356° F. using a moldable paper in which 43.6% added lignin had been incorporated with an experimentally produced sulphate pulp are given in Table I*. These data illustrate, in a specific example, the physical properties that have been studied, and the values obtained. Data for materials covering a wide range of process variables, indicating the effect of these variables on the various physical properties are given in Table II. This table is arranged in three sections: *(1)* Panels parallel laminated, tested parallel to fiber direction; *(2)* panels parallel laminated, tested perpendicular to fiber direction; and *(3)* panels cross laminated.

Each section is further divided into three groups, one for each of the pulps used: *(1)* Commercial bleachable sulphate pulp A obtained from a Wisconsin mill; *(2)* commercial bleachable sulphate pulp B obtained from a Quebec mill (Howard Smith Paper Mills, Ltd.); and *(3)* experimental high-strength laminating sulphate pulp made by U. S. Forest Products Laboratory (dig. 2644 and 2645). In each of these groups the data are arranged in order of increasing lignin content of the laminate.

The principal data from section 1 of Table II have been rearranged in simplified form in Table III to allow a more ready evaluation.

* All tests on laminated plastics reported herein, if made at the Forest Products Laboratory, were in accordance with Federal Specification for Plastics, Organic; General Specifications (Methods of Tests) L-P-406, Dec. 9, 1942.

TABLE II.—PHYSICAL PROPERTIES OF LIGNIN-FILLED LAMINATED-PAPER PLASTICS [1]

Panel number	Run number	Coated or uncoated [2]	Type of sulphate pulp [3]	Lignin content,[4] %	Moisture content of paper at time of lamination (moisture-free basis), %	Laminating pressure,[5] lb. per sq. in.	Tension: Ultimate, lb. per sq. in.	Tension: Proportional limit, lb. per sq. in.	Tension: Modulus of elasticity, 1,000 lb. per sq. in.	Edge Compression: Maximum, lb. per sq. in.	Edge Compression: Proportional limit, lb. per sq. in.	Edge Compression: Modulus of elasticity, 1,000 lb. per sq. in.	Flexure: Modulus of rupture, lb. per sq. in.	Flexure: Proportional limit, lb. per sq. in.	Flexure: Modulus of elasticity, 1,000 lb. per sq. in.	Water Absorption, 24 Hours [6]: Weight increases, %	Dimensional Change: Length, %	Dimensional Change: Width, %	Dimensional Change: Thickness, %	Specific gravity	Forest Prod. Lab. toughness, in.-lb. per in. width	Izod Impact: Flatwise, ft.-lb. per in. notch	Izod Impact: Edgewise, ft.-lb. per in. notch	Rockwell hardness, 10 + 100 kg., M scale	Shear (Johnson): Flatwise, lb. per sq. in.	Shear (Johnson): Edgewise, lb. per sq. in.	Forest Prod. Lab. plate shear,[8] Modulus of rigidity, 1,000 lb. per sq. in.	Bearing ½-in. pin, 4% of ½-in. deformation, lb. per sq. in.	Test panel thickness, inch
Section 1—Parallel laminated—tested parallel to fiber direction (grain)																														
2176-C	[9]25b	Uncoated	Commercial A	34.1	7.2	1,500	22,350	8,720	2,110	14,980	4,640	2,206	27,280	10,390	2,310	5.8	...	...	...	1.43	37.6	...	...	92.0	.....	.....	...	12,100	0.125
2221-D	[10]32	Coated	Commercial A	35.7	7.3	750	24,130	6,320	2,341	12,560	3,760	2,340	25,640	7,250	2,322	5.9	0.00	0.50	4.91	1.40	36.2	...	...	...	.....	.....	...	.....	0.113
2221-E	[10]32	Coated	Commercial A	35.7	7.2	750	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	9.78	1.38	...	.....	.....	...	.....	0.445
2221-F	[10]32	Coated	Commercial A	35.7	7.7	1,500	22,000	6,300	2,406	14,570	3,040	1,794	25,740	8,920	2,094	6.6	...	...	...	1.43	38.3	...	...	...	.....	.....	...	.....	0.113
2175-C	[9]25	Uncoated	Commercial A	37.9	6.9	1,500	19,590	6,820	2,360	15,920	4,000	2,148	28,480	11,020	2,078	4.5	...	...	...	1.43	31.0	...	...	...	.....	.....	...	.....	0.134
2194-E	[9]28	Uncoated	Commercial A	43.6	6.7	500	18,280	5,860	1,990	13,800	3,410	1,848	22,930	8,460	1,750	5.7	...	...	...	1.36	31.0	...	...	...	.....	.....	...	.....	0.128
2194-D	[9]28	Uncoated	Commercial A	43.6	6.8	750	19,780	7,420	1,928	13,110	3,460	1,864	23,870	9,660	1,929	5.3	...	...	...	1.40	29.8	...	...	...	.....	.....	...	.....	0.120
2204-C	[10]29b	Uncoated	Commercial A	44.9	6.9	500	18,560	5,200	2,080	14,890	3,220	1,817	22,900	7,140	1,761	5.2	...	...	...	1.37	33.7	...	...	...	.....	.....	...	.....	0.128
2203-H	[10]29	Uncoated	Commercial A	47.0	6.4	250	17,320	5,820	1,678	10,450	3,670	1,634	20,260	7,950	1,736	5.6	...	...	...	1.30	25.6	...	...	...	.....	.....	...	.....	0.135
2203-A	[10]29	Uncoated	Commercial A	47.0	6.6	500	18,280	5,790	1,974	13,290	3,620	1,770	21,920	9,220	1,703	5.0	0.00	0.35	3.11	1.38	29.4	...	...	75.2	9,770	.....	...	.....	0.129
2203-D	[10]29	Uncoated	Commercial A	47.0	6.3	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	[12]6.40	[11]1.20	...	.....	.....	...	.....	0.515
2203-E	[10]29	Uncoated	Commercial A	47.0	6.4	750	18,930	6,440	1,885	12,110	3,540	1,857	22,660	8,500	1,911	4.6	...	...	...	1.39	29.6	...	...	...	.....	.....	...	.....	0.128
2230-A	[10]35	Uncoated	Commercial B	37.0	7.5	500	22,620	5,860	2,478	11,940	2,860	2,133	23,660	8,650	2,061	5.9	...	...	...	1.39	36.6	...	...	...	.....	.....	...	.....	0.124
2230-C	[10]35	Uncoated	Commercial B	37.0	7.4	750	23,860	6,690	2,387	13,020	4,460	2,714	24,480	7,810	2,184	5.5	0.00	0.40	3.27	1.41	41.1	...	...	92.0	.....	.....	...	15,200	0.139
2230-I	[10]35	Uncoated	Commercial B	37.0	8.0	1,000	22,820	5,640	2,530	14,050	3,320	2,203	24,590	8,180	2,148	5.0	...	...	...	1.43	38.7	...	...	...	.....	.....	...	.....	0.127
2229-C	[10]35	Coated	Commercial B	38.6	7.7	750	25,260	5,650	2,718	14,420	3,620	2,287	26,360	8,680	2,283	6.1	...	...	...	1.42	40.0	...	...	...	.....	.....	...	.....	0.121
2229-J	[10]35	Coated	Commercial B	38.6	7.0	750	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	10.37	1.32	...	.....	.....	...	.....	0.491
2229-H	[10]35	Coated	Commercial B	38.6	7.1	1,000	24,800	6,770	2,542	14,520	2,700	2,392	27,320	10,060	2,270	5.9	...	...	...	1.42	38.5	...	...	...	.....	.....	...	.....	0.119
2226-B	[10]36	Coated	Commercial B	38.8	6.7	750	25,090	4,950	2,840	13,660	4,000	2,371	27,030	8,260	2,334	6.4	...	...	...	1.40	41.1	...	...	...	.....	.....	...	.....	0.129
2226-M	[10]36	Coated	Commercial B	38.8	6.9	750	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	10.17	1.48	...	.....	.....	...	.....	0.503
2226-O	[10]36	Coated	Commercial B	38.8	7.2	1,000	22,430	6,240	2,376	14,480	3,080	2,195	25,540	7,220	2,155	4.8	...	...	...	1.42	39.4	...	...	...	.....	.....	...	.....	0.123
2239-A	[10]37	Uncoated	Experimental	43.2	7.7	500	28,520	7,160	2,513	13,680	3,770	2,320	27,130	9,000	2,306	5.2	0.00	0.40	4.12	1.39	46.0	...	...	76.2	11,290	.....	...	13,445	0.135
2239-D	[10]37	Uncoated	Experimental	43.2	7.4	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	12.82	1.82	...	.....	10,790	...	.....	0.493
2239-B	[10]37	Uncoated	Experimental	43.2	7.8	750	28,230	5,900	2,744	14,360	3,760	2,324	27,740	10,340	2,366	5.3	...	...	...	1.41	46.2	...	...	...	.....	.....	..	.....	0.128
2239-C	[10]37	Uncoated	Experimental	43.2	7.7	1,000	27,610	6,940	2,629	13,240	3,640	2,412	26,890	9,550	2,354	4.8	...	...	...	1.41	45.4	...	...	...	.....	.....	...	.....	0.128
2238-K	[10]37	Uncoated	Experimental	43.2	7.5	500	24,500	5,940	2,317	12,610	3,447	2,147	25,470	9,640	1,909	5.5	...	...	...	1.38	49.2	...	...	...	.....	.....	...	.....	0.132
2238-I	[10]37	Uncoated	Experimental	43.2	7.5	500	25,600	7,430	2,067	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	...	...	...	.....	.....	...	.....	0.125
2237-C	[10]37	Coated	Experimental	45.0	7.7	250	25,990	6,180	2,490	12,260	3,260	2,157	25,190	9,000	1,944	6.3	...	...	...	1.35	44.5	...	...	...	.....	.....	...	.....	0.129
2237-A	[10]37	Coated	Experimental	45.0	7.5	500	27,340	6,140	2,470	13,840	4,130	2,188	27,860	7,580	2,348	5.8	0.00	0.45	4.25	1.40	46.0	...	...	79.0	.....	.....	...	12,215	0.130
2237-G	[10]37	Coated	Experimental	45.0	5.9	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	10.54	1.63	...	.....	.....	...	14,427	0.499
2237-B	[10]37	Coated	Experimental	45.0	7.8	750	26,910	5,220	2,620	14,400	3,280	2,260	27,160	9,280	2,167	5.5	...	...	...	1.40	46.6	...	...	...	.....	.....	...	.....	0.126
Section 2—Parallel laminated—tested perpendicular to fiber direction (grain)																														
2221-G	[10]32	Coated	Commercial A	35.7	8.1	750	7,960	3,020	970	11,900	2,730	926	12,020	4,840	950	7.0	...	...	...	1.40	43.7	...	...	...	12,830	.....	541	.....	0.116
2221-F	[10]32	Coated	Commercial A	35.7	7.2	750	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	9.65	1.52	...	.....	14,990	...	.....	0.445
2203-J	[10]29	Uncoated	Commercial A	47.0	7.0	500	6,380	2,040	1,114	11,700	1,760	924	11,840	5,240	890	5.2	...	...	...	1.37	36.8	...	...	...	12,000	.....	...	.....	0.136
2203-D	[10]29	Uncoated	Commercial A	47.0	6.3	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	[12]490	[11]1.20	...	.....	12,135	...	.....	0.515
2230-H	[10]35	Uncoated	Commercial B	37.0	8.1	750	8,400	2,610	986	12,040	1,360	938	12,960	4,020	1,036	5.3	...	...	...	1.41	44.5	...	...	...	12,290	.....	569	.....	0.124
2229-J	[10]35	Coated	Commercial B	38.6	7.0	750	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	8.86	1.30	...	.....	.....	...	.....	0.491
2226-M	[10]36	Coated	Commercial B	38.8	6.9	750	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	13.17	1.67	...	.....	.....	...	.....	0.503
2239-E	[10]37	Uncoated	Experimental	43.2	7.1	500	8,730	2,690	927	11,620	1,630	953	12,240	4,280	950	5.3	0.16	0.15	4.32	1.40	44.2	...	...	77.6	.....	.....	...	.....	0.129
2239-D	[10]37	Uncoated	Experimental	43.2	7.4	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	13.10	1.65	...	.....	13,850	...	.....	0.493
2238-L	[10]37	Uncoated	Experimental	43.2	7.5	500	8,560	2,960	918	11,250	2,280	818	11,960	5,030	869	..	...	...	...	1.37	45.5	...	...	...	.....	.....	...	.....	0.119
2237-G	[10]37	Coated	Experimental	45.0	5.9	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	12.90	1.56	...	13,150	14,430	...	.....	0.499
Section 3—Cross laminated																														
2221-H	[10]32	Coated	Commercial A	35.7	7.6	750	15,040	3,980	1,699	12,610	2,840	1,490	18,320	5,540	1,574	7.4	...	...	...	1.40	25.9	...	...	...	.....	.....	555	.....	0.115
2194-N	[9]28	Uncoated	Commercial A	43.6	7.7	500	11,580	3,450	1,478	11,580	2,140	1,310	17,310	5,640	1,332	6.5	...	...	...	1.37	22.8	...	...	...	.....	.....	...	.....	0.124
2203-M	[10]29	Uncoated	Commercial A	47.0	6.5	500	10,920	3,700	1,452	12,690	1,780	1,326	16,950	5,790	1,234	5.5	...	...	..	1.37	22.0	...	...	...	.....	.....	...	.....	0.127
2230-D	[10]35	Uncoated	Commercial B	37.0	7.8	750	15,030	4,060	1,760	12,300	2,440	1,624	19,430	6,500	1,650	6.1	...	...	...	1.40	25.4	...	...	...	.....	.....	543	.....	0.123
2239-F	[10]37	Uncoated	Experimental	43.2	7.5	500	16,770	4,050	1,793	13,110	2,460	1,694	20,000	5,720	1,673	5.3	0.00	0.20	4.42	1.39	31.8	...	...	88.2	11,530	.....	...	13,845	0.126
2239-P	[10]37	Uncoated	Experimental	43.2	7.5	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	...	...	...	...	...	8.51	1.59	...	.....	.....	...	.....	0.490
2238-J	[10]37	Uncoated	Experimental	43.2	7.5	500	15,190	4,080	1,658	9,830	2,295	1,340	19,335	6,100	1,353	5.7	...	...	...	1.39	20.6	...	...	...	.....	.....	...	.....	0.129

[1] The preparation, conditioning, and testing of specimens conforms to the Federal Specification for Plastics, Organic; General Specifications (Methods of Tests) L-P-406, Dec. 9, 1942, and further described in Forest Products Laboratory Mimeo. 1319 (Restricted).
[2] Lignin-filled paper coated at size-press of paper machine with aqueous suspension of lignin (Pickup of lignin, 1 to 9%).
[3] Commercial A—Commercial bleachable sulphate pulp obtained from a Wisconsin mill. Commercial B—Commercial bleachable sulphate pulp obtained from a Quebec mill. Experimental—Experimental laminating sulphate made by U. S. Forest Products Laboratory (Dig. 2644 and 2645).
[4] Lignin content—Lignin filler plus lignin coating (if applicable) based on total moisture-free weight of laminating paper.
[5] Laminating conditions: Temperature, 356° F.; Time, 10 minutes for ½-inch thickness, 20 minutes for ½-inch thickness; panels cooled before release of pressure.
[6] 3 by 1 by ½-inch samples conditioned in oven at 122° F. for 24 hours prior to test. [7] Intermediate machin- (Forest Products Laboratory Mimeo. 1308). [8] Forest Products Laboratory Mimeo. 1301.
[9] Lignin precipitated in the presence of pulp (Runs 25, 26, 27, 28, and 30). [10] Lignin precipitated in the absence of pulp (Runs 29, 31 to 38, inclusive).
[11] Test carried out at National Research Council of Canada (B. S. S. notch used).

Effect of Lignin Filler Content

Data covering a considerable range of lignin filler content is available only for pulp A. In general, with increasing lignin content, the physical strength properties become somewhat poorer (Table II). In the range covered, 34.0 to 47.0% lignin content, the tensile strength of the plastic decreased with increase in lignin content from 24,000 to 19,000 p. s. i., the edge compressive strength from 16,000 to 12,000 p. s. i., the flexural strength (modulus of rupture) from 28,000 to 22,000 p.s.i., and the Forest Products Laboratory toughness value from 38 to 29 inch pounds per inch width. The modulus of elasticity in tension decreased from 2,400,000 to 1,900,000 p. s. i. and the moduli in compression and flexure showed a similar trend. However, with increasing lignin content, the pressure required for satisfactory lamination decreased, and in general, the resistance to water absorption improved.

Effect of Sulphate Pulp Used

Most of the experiments were based on commercial sulphate pulps available at the time the project was started, and, except for the instance cited later, no attempt had been made to develop in the pulp such properties as might particularly suit them for use in the production of high-strength laminates. Although laminates with only a limited range of lignin content were prepared from pulp B comparison of test data with that of laminates from pulp A of approximately the same lignin content indicates somewhat better tensile strength, toughness, and moduli of elasticity for pulp B accompanied with a slightly lower edge compressive strength and modulus of rupture (Tables II and III).

To determine the degree of improvement which might be expected if a special high-strength type of sulphate pulp previously found suitable for the production of high-strength phenolic paper plastics is employed, an experiment was made using such a pulp prepared from black spruce at the Forest Products Laboratory. The improvement in strength properties obtained in the plastic laminate from this pulp was quite marked, when compared with those of the laminate from the commercial pulp A of similar lignin content (43.2 and 43.6% lignin, respectively, Table III). The laminate from the U. S. Forest Products Laboratory pulp gave values approximately 50% higher for tensile strength and toughness, 15% higher for modulus of rupture, 25 to 35% higher for the moduli of elasticity, together with a slight improvement in resistance to water absorption. However, no significant difference was obtained in the edge compressive strength value.

TABLE IV.—DISTRIBUTION OF STRENGTH IN LAMINATED SAMPLES RESULTING FROM ORIENTATION OF PAPER IN LAMINATION

(Values given indicate range obtained in samples tested)

Strength	Parallel-laminated	Cross Laminated	
	Tested across grain	Per cent [1] of average values when tested with and across grain in parallel-laminated samples	Per cent [1] of value when tested with grain in parallel-laminated panel
	Per cent [1] of values when tested with grain		
Tensile, ultimate	31– 35	89– 94	59– 63
Tensile, modulus of elasticity	37– 56	95–105	72– 74
Edgewise compression, maximum	85– 95	101–104	95–100
Edgewise compression, modulus of elasticity	35– 52	89–105	60– 75
Flexure, modulus of rupture	45– 54	97–104	71– 79
Flexure, modulus of elasticity	41– 52	92–103	68– 76
F. P. L. toughness	96–125	59– 71	58– 75
Izod, flatwise	77–130	65.7	66.4
Izod, edgewise	91–113	91.6	87.4

[1] For absolute values, refer to Table II.

TABLE V.—RELATIONSHIP BETWEEN MOISTURE CONTENT OF LIGNIN-FILLED PAPERS OF VARIOUS LIGNIN CONTENTS AND WATER ABSORPTION OF THE LAMINATED PLASTIC WHEN MOLDED AT VARIOUS PRESSURES [1]

Panel Number	Moisture Content of Paper on Moisture-free Basis, %	Laminating Pressure, lb. per sq. in.	Water Absorption 24 Hours, %
	38.8% Lignin Content		
2226–E	6.5	500	8.4
K	6.6	500	7.9
A	6.8	500	7.4
D	7.7	500	5.7
H	8.3	500	5.8
F	6.6	750	6.5
B	6.7	750	6.4
L	6.9	750	6.4
I	8.2	750	5.6
C	6.5	1,500	5.6
G	6.8	1,500	5.7
J	7.8	1,500	5.3
	43.6% Lignin Content		
2194–H	6.8	250	[2] 9.3
G	9.8	250	5.6
J	5.9	500	7.0
E	6.6	500	5.7
L	6.8	500	5.2
A	9.0	500	5.4
D	6.8	750	5.3
B	8.5	750	4.7
I	5.9	1,500	5.2
F	6.6	1,500	4.8
C	8.5	1,500	4.6
	44.9% Lignin Content		
2204–A	5.5	500	6.2
C	6.9	500	5.2
	47.0% Lignin Content		
2203–H	6.4	250	5.6
C	4.8	500	6.0
A	6.6	500	5.0

[1] Laminating conditions: Temperature, 356° F.; time, 10 minutes, panels cooled before release of pressure. Panel nominal thickness, ⅛ inch.
[2] Split.

Use of Surface Coating of Lignin on Paper

Examination of the laminating paper, while in process on the paper machine and in the finished sheet, suggested that the lignin-fiber ratio on the surfaces of the sheet was probably lower than the average ratio in the whole sheet. In appearance, there was a definite two-sideness to the sheet, probably resulting from a loss of part of the lignin originally associated with the fibers on the wire side. This loss might have taken place either during the initial period of formation on the wire, at the suction boxes, or at the felt. It was also observed that there was a slight pick-up of lignin from the top side of the sheet at the press rolls, particularly at the second press, which was made of stonite.

To enrich the lignin content on the surface of the lignin-filled sheet, experiments were made in which the partially dried paper was run through the paper machine size-press in which an aqueous suspension of purified lignin previously precipitated at 203° F. (95°C.) was used for the coating mixture. The lignin, having a particle size in the general range of 5 to 10 microns, was made into a 15 to 20% suspension and the pH (initially 4.8) was adjusted with lime to 6.1 for runs 35 and 36 (panel Nos. 2226 and 2229) and 7.12 for run 37 (panel No. 2237). The lignin pick-up under these conditions amounted to 1 to 9%. The results obtained were inconclusive, however. Comparison of the data (Table II, section 1) indicates that the laminates made from the coated paper from runs 35 and 36 are approximately 1,000 p.s.i. higher in strength values than those made from the uncoated portion of run 35 whereas in run 37, with a portion of the paper coated and a portion uncoated,

[5] Laminating conditions: Temperature, 356° F.; Time, 10 minutes for ½-inch thickness, 20 minutes for ½-inch thickness; panels cooled before release of pressure.
[6] 3 by 1 by ½-inch samples conditioned in oven at 122° F. for 24 hours prior to test.
[7] Intermediate machine (Forest Products Laboratory Mimeo. 1308).
[8] Lignin precipitated in the absence of pulp (Runs 29, 31 to 38, inclusive).
[9] Test carried out at National Research Council of Canada (Th. S. notch used).
*Forest Products Laboratory Mimeo. 1301.

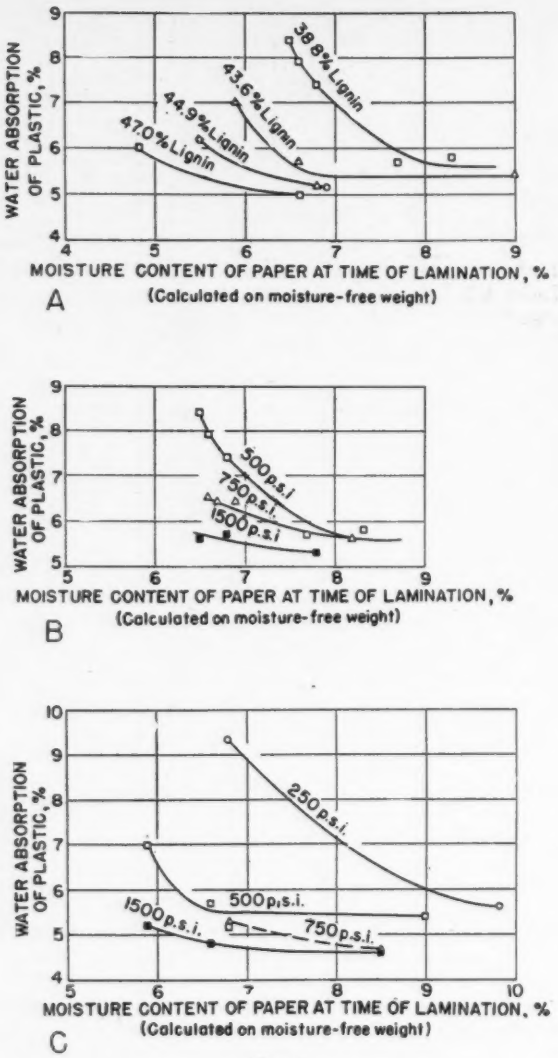

FIG. 1

Relation between moisture content of lignin-filled paper at time of lamination and water absorption of the laminated plastic. Laminating temperature, 356° F. A, effect of lignin content, laminating pressure 500 p.s.i.; B, effect of laminating pressure, lignin content 38.8%; C, effect of laminating pressure, lignin content 43.6%.

a reversed condition was observed for the tensile strength although other strength properties were not generally affected. The reason for this discrepancy has not been established although it is possible that the pH of the coating mixture, or the lime added, might have played an important role. Inasmuch as the range of improvement in properties that might be obtained from this procedure is not great, it is believed that this problem could be further investigated in commercial production, where sustained operation allows a more satisfactory study of the process variables involved.

Orientation of Paper in Lamination

In the manufacture of laminating paper the fibers tend to assume a higher degree of orientation in one direction (machine direction) and the resultant sheet exhibits anisotropic strength properties. Thus in laying up the paper sheets for lamination, this anisotropic characteristic can be carried through into the final panel by "parallel lamination." Alternatively by "cross lamination," (crossing the direction of alternate sheets) a panel having balanced strength properties can be obtained.

The general relationship of the strength values obtained in parallel and cross laminates is shown in Table IV. With parallel-laminated samples, tested at room temperature, the most marked difference is shown in the tensile strength, wherein the crosswise tests average only about 33% of the lengthwise tests. The comparison for modulus of rupture is 50%, edge compressive strength 90%; and the moduli of elasticity between 35 and 56%. However, with toughness and Izod, the crosswise strength values may be somewhat higher than those in which the direction of test is lengthwise.

In cross laminated samples, the strength values in either direction are in the range of 90 to 105% of the average values obtained from crosswise and lengthwise tests on parallel-laminated samples with the exception of Izod impact strength (flatwise) and the Forest Products Laboratory toughness, which are about 65%. The reason for these losses in impact and toughness strengths in cross laminated material cannot be explained at present.

The relationship of strength tests in cross-laminated samples to the lengthwise test in parallel-laminated samples is also shown in Table IV.

Laminating Pressure

In general, the pressure required for satisfactory lamination decreases with increasing lignin and moisture contents when the laminating temperature is held constant. Figure 1 (data from Table V) illustrates the relationship between moisture content of the lignin-filled paper at time of lamination and the water absorption of the laminated plastic when the laminating temperature is 356°F. Figure 1, A, with laminating pressure constant (500 p.s.i.), shows that the moisture content of the laminating paper becomes less critical at higher lignin content. The plastic containing 47% lignin has a water absorption value of 6% when a laminating paper containing 4.8% moisture is used. To obtain a similar water absorption value with the plastic containing 38.8% lignin, 7.6% moisture in the paper is required. With a paper containing 38.8% lignin and having an appreciably lower moisture content, the water absorption value of the plastic is considerably increased.

Figures 1B and 1C compare the effect of varying laminating pressures with papers of 38.8 and 43.6% lignin content, respectively, using the same ordinates. From these curves it is evident that the moisture content of the laminating paper becomes less critical when higher laminating pressures are used.

If the laminating pressure is lower than is optimum for either the lignin content or the moisture content of the paper, the moisture absorption value of the plastic will not only be high, but the edge compressive strength will be low. (Table II.) With increased pressure these properties improve, but when the pressure is still higher, certain of the strength properties, notably the tensile strength, decrease appreciably.

The approximate pressures required for laminating lignin-filled papers of various lignin contents are shown in Table VI.

As examples of panels laminated in the lower pressure range, reference is made to panels 2203-H and 2237-C shown in Table II. These panels containing 47 and 45% lignin, respectively, were molded at 250 p.s.i. The strength values are 1,000 to 2,000 p.s.i. lower than those obtained with the same material

laminated at higher pressures. The water absorption values, 5.6 and 6.3%, respectively, although higher than those obtained with panels of the same lignin content laminated at higher pressures, are within an acceptable range for many purposes. At the time the various machine-runs were made, it was assumed that a laminate containing 45% lignin would be relatively brittle and low in strength properties and that higher lignin contents would be in an unacceptable range. However, the results subsequently obtained, particularly on the laminates containing high-strength fiber, indicate exceptional toughness when compared with other laminated materials. It is assumed that even with considerably higher lignin content, a desirable product can be obtained. No doubt a product of this type could be laminated in a lower pressure range.

Use of Special Surface Sheets to Improve Resistance to Water Absorption of Lignin-filled Laminates

None of the lignin-filled laminates discussed so far have contained resin, other than lignin. A study was made to establish the degree of improvement in resistance to water absorption that might be obtained through the use of phenolic resin applied to the surface sheets in the form of a varnish before lamination. The experiments also included a mixed lignin-phenolic varnish and a 100% lignin varnish. The data obtained are shown in Table VII. Although the results are of a preliminary nature, a definite improvement in resistance to water absorption is indicated. The use of approximately 25% phenolic resin on the surface sheet was sufficient to reduce the water absorption from 5.0 to 2.9%. This quantity of phenolic resin is relatively small when based on the weight of the final laminate, being only 1.2% on a ⅛-inch panel. The appearance and mar-resistance of the panel are also considerably enhanced by this procedure. Accelerated weathering tests on both normal and surface-sheeted laminates are in progress.

Comparison of Lignin-filled Paper Laminates with Other Laminated Materials

With the exception of edge compressive strength (14,000 to 15,000 p.s.i.), the physical properties obtained appear to be equal or superior to the conventional-type paper base laminates on the market. However, the strength properties so far obtained, with the exception of toughness and impact, are considerably lower than the papreg currently in development at the U. S. Forest Products Laboratory. As shown in Table VIII, Izod impact values, both flatwise and edgewise, are from two to three times as great as those so far reported for papreg and many times greater than those for the conventional paper laminates. The Izod face impact values are considerably higher than those for fabric base laminates and compreg, and about equal to those for heat-stabilized wood and parallel-laminated birch plywood which has the advantage of lower specific gravity. Parallel-laminated wood has a high edge impact value with the grain but low across the grain. Glass-fiber base phenolic laminates appear to have impact values considerably higher than any reported on the type of material under discussion.

TABLE VI.—APPROXIMATE PRESSURE REQUIRED FOR LAMINATING LIGNIN-FILLED PAPERS OF VARYING LIGNIN CONTENT [1]

Lignin Content,	Pressure Required to Give Laminates Having Suitable Balance of Physical Properties,	Minimum Pressure for Lamination,
%	lb. per sq. in.	lb. per sq. in.
35	1,000-1,500	750
40	750-1,000	500
45	500- 750	250

[1] Temperature, 356° F. Moisture content of paper, 6.5 to 7.5% on moisture-free basis.

The changes in tensile and Izod impact strengths of the lignin-filled paper laminate were determined for both low and high temperatures. At low temperatures the samples were first conditioned for 24 hours at —68°F. and then were packed in dry ice (—110°F.). The tensile specimens were packed for 8 hours and the Izod specimens were packed for 30 minutes to 1 hour. The tensile specimens were repacked in dry ice for test, the machine grips being cooled in an outer chamber maintained at —20° to —60°F. The impact tests were made on a machine in the open atmosphere, within 20 to 30 seconds after taking the specimens from the cold box. For tests at high temperatures the samples were placed in an oven at the desired temperature for 24 hours prior to testing, then tested on a machine at room temperature.

The results of these tests are shown in Table I. A parallel-laminated sample (2239-A), having a tensile strength of 28,520 p.s.i. tested flatwise with the grain, at room temperature, was found to have a tensile strength of 19,480 p.s.i. at 200°F. (2239-Q) a loss of 31.6%. Comparing the same material (2239-E) tested across the grain at room temperature and at 158°F.

TABLE VII.—EFFECT OF SPECIAL SURFACE SHEETS ON WATER ABSORPTION OF LIGNIN-FILLED LAMINATES. (LIGNIN-FILLED LAMINATING PAPER COATED ON ONE SIDE WITH RESIN VARNISH OF INDICATED COMPOSITION. ONE PLY, RESIN SIDE OUT, PLACED ON EACH SURFACE OF LAY-UP) [1]

	Base Sheets			Surface Sheets					Laminates			
						Resin Varnish						
Panel No.	Run No.	Moisture content of paper on moisture-free basis, %	Lignin content on moisture-free basis, %	Paper No.	Lignin content before coating, %	Lignin content of total solids, %	Phenolic content of total solids, %	Resin pick-up on paper, %	Added total resin on panel, %	Added phenolic resin on panel, %	Water absorption, 24 hours, %	Decrease in water absorption due to surface sheet, %
2203A	29	6.6	47.0	....	...	...	...	...	...	...	5.0	..
2203K	29	7.6	47.0	2203	47.0	0	[2] 100	23.1	1.19	1.19	2.9	42
2203Q	29	6.5	47.0	2195	41.6	33	[3] 67	12.3	0.50	0.33	3.9	22
2238A	37	7.6	43.2	....	...	...	...	...	...	...	6.4	..
2238F	37	7.5	43.2	2203	47.0	0	[2] 100	23.5	1.24	1.24	3.6	44
2238H	37	7.3	43.2	2195	41.6	33	[3] 67	19.3	0.89	0.59	4.3	33
2238E	37	7.2	43.2	2226	38.8	100	...	14.3	0.70	...	5.5	14

[1] Laminating conditions: Pressure 500 p.s.i.; temperature 356° F.; time, 10 minutes. Panels cooled before release of pressure. Panel thickness: ⅛-inch nominal.
[2] Spirit soluble resin BV-13850.
[3] Water soluble resin BR-5995.

TABLE VIII.—NOTCHED IZOD IMPACT VALUES OF LAMINATED MATERIALS

Material	Specific Gravity	Izod Impact: With Grain, Flatwise, ft.-lb. per in. notch	Izod Impact: With Grain, Edgewise, ft.-lb. per in. notch	Izod Impact: Across Grain, Flatwise, ft.-lb. per in. notch	Izod Impact: Across Grain, Edgewise, ft.-lb. per in. notch
Glass-fiber-base Phenolic Laminates					
Panelyte PC 5576[1]	1.99	25.2	18.6	21.5	17.2
Parallel-laminated Wood Base Materials					
Birch[2]	....	11.8	10.9	....	....
Birch plywood[3]	.77	13.9	....	....	....
Heat stabilized wood[3]	1.35	13.0	....	....	....
High impact compreg[3]	1.35	6.6	....	....	....
Low impact compreg[3]	1.23	2.7	....	....	....
Fabric-base Phenolic Laminates					
Grade L, light weight fabric base[4]	1.34	3.8–4.8	2.22	3.6–4.0	1.5
Grade C, heavy weight fabric base[4]	1.34	2.7–3.2	1.4–1.5	2.5–2.8	1.8–2.0
Paper-base Phenolic Laminates					
Papreg[5]	1.40	4.0–6.0	0.7–0.8	1.6–1.8	0.5–0.6
Grade XX[3]	1.34	1.7–1.9	0.6	1.9–2.1	0.6
Paper-base Lignin-filled Laminates					
43.2% lignin, experimental sulphate pulp	1.40	12.8	1.8	13.3	1.7
38.8% lignin, commercial sulphate pulp	1.40	10.2	1.5	13.2	1.7

[1] Barber, R. W., *Mechanical Engineering*, page 88, December, 1942.
[2] Stamm, A. J., Seborg, R. M., Millett, M. A., *U. S. Forest Products Laboratory Restricted Mimeo.*, No. 1386 (May, 1943).
[3] Unpublished data from the U. S. Forest Products Laboratory (Restricted).
[4] Oberg, T. P., Schwartz, R. T., Shinn, D. A., *Modern Plastics* 20, No. 8, 87, April, 1943.
[5] Erickson, E. C. O., Boller, K. H., *U. S. Forest Products Laboratory Restricted Mimeo.*, No. 1319, page 5 (March, 1943).

(2239-Q) a decrease of 26% in tensile strength was obtained. A cross-laminated sample of the same material (2239-F) dropped in tensile strength from 16,770 p.s.i. at room temperature to 14,770 p.s.i. at 158°F. (2239-G) a loss of 12%. A cross-laminated sample of papreg tested over the same range of temperatures was found to drop 26% in tensile strength between room temperature and 158°F. and 38% between room temperature and 200°F. In spite of the fact that lignin is a thermoplastic material, the loss in tensile strength at high temperatures is actually slightly less than that with the thermosetting phenolic.

When another sample (2238-I) of the lignin-filled plastic was tested at room and subzero temperatures (approximately —100°F.) an increase in tensile strength from 25,600 to 27,100 p.s.i. or 5.9% was obtained.

In general, the Izod impact strength values made on the lignin-filled paper laminates at high and low temperatures were somewhat lower than those made at room temperature (Table I), a characteristic of phenolic laminates as well. For example, a parallel-laminated panel having an Izod impact strength value of 12.82 foot-pounds per inch of notch when tested with the grain at room temperature gave a value of 10.47 foot-pounds at 200°F., a loss of 18.3%, and 9.76 foot-pounds at —68°F., a loss of 23.9%. In spite of these strength losses with change in temperature, the values obtained both at high and low temperature are still much higher than those obtained from papreg and conventional laminates tested under the most favorable conditions (room temperature).

Exploratory gluing tests using cold-setting urea high- and low-temperature phenolic-resin glues have indicated that good bonds can be obtained, with failures occurring almost entirely in the lignin-filled paper plastic rather than in the glue line, when the surfaces to be glued are lightly sanded.

In any application requiring large quantities of material having strength properties in the range of conventional plastics, and where high impact strength is of special importance, the lignin-filled paper-base laminates appear to offer excellent possibilities.

Literature Cited

1. U. S. Forest Products Laboratory Report No. 1595, Properties of laminated plastics made from lignin and lignin-phenolic resin-impregnated papers.

The Engineer in Society

D. Van Nostrand Company has just published The Engineer in Society by John Mills, author of Electronics: Today and Tomorrow. (196 pp. 5½ x 8½). This is a popularly written book about engineers and scientists and their relationship to the economics and politics of the world.

In provocative terms, based on long experience with industrial scientists, Mr. Mills advances challenging ideas on the importance and quality of aptitude tests, the salaries of engineers and scientists, woman's part in engineering work, business executives and research, and organization of engineers and scientists. He reveals the behind-the-scenes road blocks that must be passed.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $2.50 per copy.

Sales Management

McGraw-Hill has recently issued "Basic Problems of Sales Management," by Frank La Clane, associate editor of Printers Ink Magazine. (115 pp. 5½ x 8). This is a handy refresher course for sales managers and returning veterans. Among the problems discussed are the hiring and training of salesmen, creating sales manuals and sales training films, compensation of salesmen, laying out sales territories, handling sales objections, handling salesmen's expenses, writing to salesmen, salesmen's reports, sales conventions and sales contests.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $1.25 per copy.

Applied Energy Conversion

Applied Energy Conversion, by Bernhardt G. A. Skrotzki, assistant editor of Power, and William A. Vopat, assistant professor of mechanical engineering at the Cooper Union School of Engineering, is a recent McGraw-Hill Book dealing with power plant engineering. (509 pp. 6 x 9). It covers the equipment and economics of industrial and central station power plants, describing the characteristics and performances of the major elements. No attempt is made to present an extensive treatment of structural details or design. A feature of the book is a thorough presentation of engineering economics. Each chapter is well illustrated and includes a number of typical problems for solution as well as a good bibliography.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $5.00 per copy.

A Stock Inlet for Paper and Paperboard Machines*

By S. A. Staege[1]

Abstract

The conversion of stock cross flow from each side of the machine to parallel machine direction flow is the secret of uniform stock distribution with uniform weight and formation.

This is accomplished by the use of the two tapered ducts of an inlet with a common slot orifice discharging to the full deckle width of the wire.

Variations in the total volume of flow, within the design limits, does not affect the uniformity of fiber distribution and velocity.

A stock inlet does not aid in the preparation of the stock, but when furnished with suitable stock and at the right consistency, it should bring the stock to the headbox or vat in the best possible condition. The best possible condition requires that a uniform volume of stock with uniformly dispersed fibers and at uniform consistency be delivered to every increment of width of the forming wire. There must be an equable mixture of the long and short fibers, of the light and heavy fibers and the stock mixture must be delivered at an unvaried velocity over the entire forming width and in parallel machine direction flow.

The stock inlet does not make the sheet but it is one of the most important contributing factors in the sheet formation. A suitable slice is necessary in a fourdrinier machine and proper vat conditions in the cylinder machine but without a uniform distribution of uniform stock, a level, well-formed sheet cannot be made.

If the stock is not uniform in consistency, freeness, and fiber distribution, the sheet will not be uniform in weight, strength characteristics, and appearance and will not present a level printing surface.

If there are cross currents and varying velocities in the headbox with eddies and turbulence, the slice cannot correct these faults and produce a level sheet.

If the stock is not brought into the headbox or vat uniformly the use of baffles, perforated rolls, and similar devices cannot completely correct the condition. They can partially distribute the flow but cannot produce the uniformity of conditions necessary for the best formation.

From a hydraulic analysis of the conditions as well as practical experience, it does not appear that stock brought into a headbox or vat from one or more points across the width of the machine can be made to flow with uniform velocity at all points or that suitable dispersion and distribution of fibers can be obtained or maintained, especially for volumes of flow which have to be varied from time to time for different types and weights of sheets and corresponding machine speeds.

The problem is therefore presented as to how uniform flow and stock distribution can be obtained.

Action of New Inlet

If stock is brought in from the side and flows all the way across the machine, means are available for distributing infinitely small portions of whatever type of stock is flowing to every increment of space across the entire width of the machine so that exactly the same kind of stock of the same consistency and freeness is distributed all the way across.

Straightening vanes for changing the direction of flow of the stock from right angle to parallel with the machine direction are not permissible for practical reasons as well as theoretical. However, by utilizing cross flow from both sides of the machine with parallel tapered ducts and a common slot orifice the direction can be changed from cross flow to parallel flow without the use of straightening vanes of any kind. This is the principle employed in the so-called Hydronamic stock inlet, the name being derived from the two words hydro and dynamic.

By employing tapered ducts extending across the machine with stock extraction all the way across, the velocity in the ducts is maintained the same at all points, a hydraulic condition necessary for uniform pressure differential across the slot orifice and uniform flow through the orifice throughout its entire length.

Were there only one cross flow tapered duct employed, the discharge through the slot orifice would have a somewhat diagonal component because the flow in the duct is at right angles to the machine direction. However, with the stock in the two tapered ducts flowing in opposite directions and discharging through the same common slot orifice, the two thin streams of stock merge in the slot orifice into one homogenous stream flowing parallel to the machine direction and with uniform velocity throughout for any given total volume of flow. It will be observed, therefore, that the initial slight angularity of the two streams of stock caused by the cross flow in the tapered ducts is compensated and neutralized by the merging of the two streams.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N.Y., Feb. 25-28, 1946.

[1] Member, TAPPI; Consulting Engineer, The Black-Clawson Co., Hamilton, Ohio.

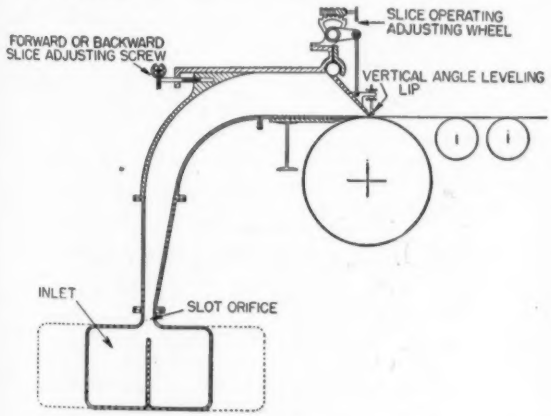

FIG. 1
Pressure Inlet for High Speed Fourdrinier Machines

It should be pointed out however that the degree of angularity of the two streams of stock from the two tapered ducts is small in any event because the stock velocity in the tapered duct is small compared to the stock velocity through the slot orifice. As a matter of fact in conventional design, the proportions are such that the velocity head resulting from the velocity in the ducts is not more than approximately 10% of the velocity head resulting from the velocity through the slot orifice. As the velocity in the tapered duct is relatively low, seldom more than 3 feet per second, and as the stock velocity through the slot orifice may be of the order of 6 to 10 feet per second the initial angularity of the two flows is very slight, but in any event the combining of the two flows in the orifice completely converts the discharge from the orifice to parallel machine direction flow.

From the inlet slot orifice a flat tapered duct the full width of the sheet extends from the orifice to the vat circle, the slice or open headbox, as the case may be, slowly decelerating the stock velocity as it leaves the slot orifice until it reaches its immediate destination in a smooth flowing stream.

The flat angle taper from the slot orifice onward of venturi characteristics assures a minimum degree of turbulence and provides the most favorable flow characteristics for sheet formation.

A small amount of stock recirculation is provided from the small end of each tapered duct discharging into the large end of the adjacent tapered duct. This eliminates any dead ends where stock fibers might accumulate.

In the design of the inlet, the common wall between the two tapered ducts, which constitutes a diagonal partition in the rectangular inlet box, does not extend all the way to the top of the duct but terminates an inch or two from the top depending upon the size of the inlet, so that there is free communication between the two ducts throughout their entire length providing ample opportunity for the combining of the two jets of stock into one homogeneous stream.

The flow characteristics of the inlet are not critical. The amount of stock entering each of the two tapered ducts does not have to be accurately balanced and moderate differences in flow between the two ducts have no detectable effect. Furthermore, the stock velocities in the ducts and in the slot orifice can be varied over a wide range without appreciable effect in performance. For this reason it has been found unnecessary to make the slot orifice adjustable for any ordinary requirements, all of which lends itself to simplicity of design and economic desirability.

While this inlet is a most desirable feature for any paper machine, it lends itself especially well to the pressure inlet and slice, with the elimination of the large cumbersome headbox which becomes such a monstrosity especially in high speed machines. Not only does the head-works structure with the pressure-type, inclosed inlet become relatively insignificant but the stock is not given time to flocculate and stagnate before reaching the wire. With reasonable precautions against the entrainment of air into the stock and with proper design, air and foam problems ordinarily encountered with open headboxes can be made relatively nonexistent.

Pressure Control

Cascading of stock always entrains air causing foaming and undesirable disturbance of the fibers when the air is released. It is therefore important to see that cascading does not occur.

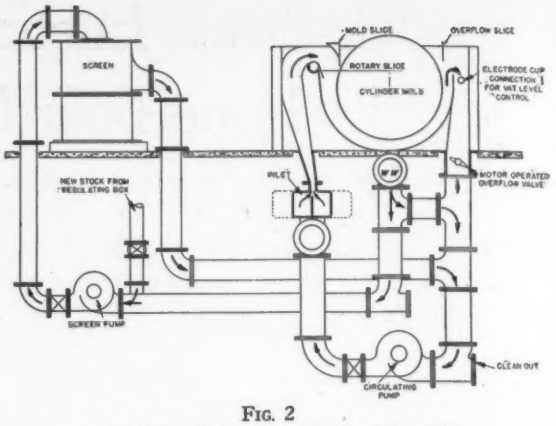

FIG. 2
Inlet Installation on an Overflow Type Vat

In the case of fourdrinier machines, in particular where there is a wide range of speed, some means of throttling the stock flow from the screens, if machine screens are used, must be provided for all paper speeds below the highest, if cascading is to be prevented because the head in the flow box, or the pressure ahead of the slice must of necessity be lower for the lower paper speeds.

With the elimination of the large headbox with adjustable throttling baffles, other means must be provided. A streamlined tear drop shaped valve in the pipe connection leading from the screen box to the inlet provides a means by which the stock level in the screen box can be maintained at the proper level to prevent cascading. For any required level in the headbox or pressure at the slice, the drop in pressure or head is taken in this throttling valve. The operation of the valve can be manual if desired but if automatically controlled will maintain the stock level in the screen box without any personal attention for all operating conditions.

Where machine screens are not used the stock is pumped directly to the headbox or slice, or cylinder machine vat, and the volume of flow is controlled by adjusting the pump speed or throttling the discharge. For any given slice opening the head can of course be controlled by adjusting the flow, or for a given flow the head can be controlled by adjusting the slice opening.

Another very satisfactory arrangement is to have the screens discharge to the suction side of the pump where the screened stock is combined with any by-passed white water, and is thoroughly mixed in the pump before being pumped to the headbox or slice or the vat.

The inlet is generally constructed of monel or stainless steel which lends itself to smooth contours and rounded corners and with freedom from corrosion. It is also provided with suitable streamlined cleanout doors. Cast iron construction for the inlet has been used but is much heavier.

Color Council to Meet May 6-7

The 15th Annual Meeting of the Inter-Society Color Council will be held at the Hotel Pennsylvania, New York, N. Y., on May 6-7, 1946. The Technical Association is a member of the Council and TAPPI members are welcome to attend. A copy of the program may be obtained on request from the secretary, Miss Dorothy Nickerson, P. O. Box 155, Benjamin Franklin Station, Washington 4, D. C.

An Effective Bleach Liquor System For Rag Halfstock Bleaching*

By Lamar A. Moss[1]

Abstract

*A description is given of a simple and effective bleach liquor handling system designed specifically for use in a rag stock mill where relatively small quantities of bleach have to be measured and delivered to each of several rag washers. The bleach solution prepared by chlorination of lime slurry using a sparger tube** is pumped by means of a cast iron sump pump automatically controlled to deliver any quantity of bleach desired for each washer to a measuring tank in the washer room. The bleach is piped from this measuring tank to each washer and is introduced into the stock through a distributing pipe.*

The measurement and distribution of bleach in relatively small quantities to the numerous rag washers in a rag halfstock mill presents some rather perplexing problems. A system designed specifically for this purpose has been in use for about two years and the results have been entirely satisfactory.

Construction of System

The bleach is made up in a steel tank 6 feet in diameter and 10 feet high equipped with a single blade, slow speed agitator carrying suspended bars adjusted to just clear the bottom of the tank. This agitator is used solely to break up and disperse the lime and must be shut down before chlorination to avoid vortexing around the agitator shaft which would result in reduced absorption and rapid loss of chlorine, which is introduced near the bottom of the tank through a silver sparger** tube. All surfaces of the tank and agitator are protected from corrosion by chlorinated rubber paint. The bleach solution is made up to approximately 11 grams per liter at a phenolphthalein flash test of 5 seconds.

After settling, the liquor is drained into a concrete storage tank below, which is equipped with a cast iron sump pump immersed right in the tank so that the pump is always primed by pressure on the intake and there are no packing glands on the pump to require maintenance or allow waste of bleach liquor.

The liquor is pumped through common iron piping to a 300 gallon stoneware measuring crock in the washer room. The pipe leading into the measuring crock extends almost to the bottom to reduce splashing in contact with the air, and 3/8 inch holes in this pipe are provided to break the vacuum and prevent syphoning back of the bleach liquor when the pump stops. This crock is elevated enough to give gravity flow through a common iron piping system underneath the washer room floor to each washer. The common pipe does corrode, but it lasts 1 to 1½ years and by the end of this time it is scaled up so that it would soon be plugged and require replacement even if no corrosion took place. Sections of glass piping have been tried but they too scale up and show no advantage to justify the extra cost.

A cast iron plug type valve is used at each washer to control the addition of bleach and a length of 1½-inch pipe, with four equally spaced 0.5-inch holes, extending across the washer tub just in front of the roll serves to distribute the bleach evenly through the stock.

The most interesting feature of the whole system is the automatic filling arrangement on the measuring tank. The level of liquor in this tank is shown on a scale on the side of the crock by a counter weight and pointer connected by a cable over two pulleys to a float in the crock. (See Fig. 1 sketch). A mercury switch mounted on a pivoted bar is arranged alongside the scale in such a way that, as the counterweight descends as the crock fills, an extension on the pointer (see enlarged sketch of scale and switch mechanism) contacts the end of this bar tipping the mercury switch up to open the circuit. This switch is connected in the pushbutton control circuit of the sump pump motor so that when the mercury switch is opened by the descending counterweight, the pump is shut down. This bar carrying the mercury switch is mounted on a threaded rod extending the full height of the crock and the position of the switch can be adjusted up or down by means of a handwheel on the bottom end of this screw rod, which is arranged to be low enough to be operated from the floor. Obviously the position at which this switch mechanism is set determines how much bleach liquor will be pumped into this measuring tank before the mercury switch shuts down the pump. An extension rod from the mercury switch mechanism carries a pointer arranged to slide up and down on a scale conveniently located at the proper height above the floor level so that the operators can readily set the switch from the floor for the desired quantity of bleach liquor and not have to climb up to the measuring tank.

Operation

In operation the switch mechanism is set by means of the handwheel to the proper position on the conveniently located scale so that the amount of bleach

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 25-28, 1946.

[1] Member TAPPI; Tech. Supt., Whiting-Plover Paper Co., Stevens Point, Wis.

** Patented by Mathieson Alkali Works, Inc.

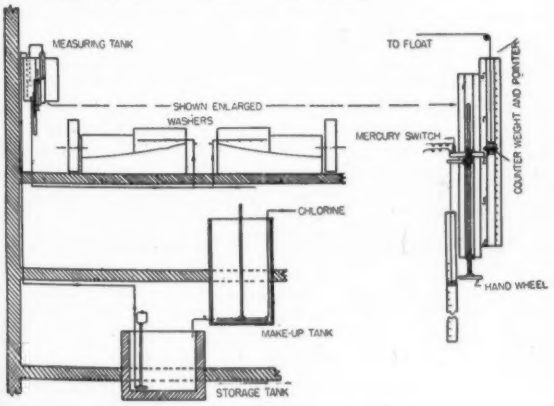

FIG 1

Bleach Liquor Sysem with Enlarged Sketch of the Automatic Measuring Mechanism and Scale

desired for one washer will be pumped up. The pump is then started manually by means of a pushbutton conveniently located in the washer room, and the proper amount of bleach is automatically pumped up so that it is ready when needed in the washer.

Furnishing the bleach to the washer is then simply a matter of opening the plug valve at the washer and draining all the measured quantity of liquor from the tank into the washer through the perforated distributing pipe.

If a different quantity of bleach is required for the next washer, the proper change in setting of the mercury switch mechanism is then made; the valve to the washer just furnished is closed; the starter button is pushed; and the required amount of bleach liquor will be ready for the next washer.

This system is simple, reasonably foolproof, easy and convenient to operate, and has given satisfactory, trouble-free operation ever since it was installed.

In spite of being immersed continuously in bleach liquor, the cast iron sump pump has stood up well in this service. It has, however, been necessary to keep a spare pump on hand as a replacement when it becomes necessary to clean out the pump or replace the steel pump shaft. Ordinarily 9 to 12 months service is obtained before such overhauling is required.

TAPPI Notes

Victor R. Johnson, formerly of St. Marys Kraft Corporation, is now assistant pulp mill superintendent for the Central Paper Company, Muskegon, Mich.

Frank Miller, formerly of Peter J. Schweitzer, Inc., is now mill chemist for the Ancram Paper Mills, Ancram, N. Y.

James E. Foote, assistant general manager of the Pulp and Paper Division of B-F-D Company, Plattsburg, N. Y., has succeeded S. S. Stevens as the official representative of the company in the Technical Association.

J. A. Higgins, formerly of John Dickinson & Company, is now assistant manager of St. Annes Board Mill Company, Bristol, England.

F. P. Lasseter, formerly of the Dorr Company, is now general manager of J. E. Hutchman Citrous Byproducts Mills, Lakeland, Fla.

Claus Jan Koren, formerly of Bohnsdalen Pulp and Paper Mills in Norway is now a Fellow of the American-Scandinavian Foundation and will spend the balance of the year studying manufacturing in American mills.

Tom Wisloff, technical manager of Hjemmet, Inc., publishers, of Oslo, Norway is visiting in the U.S.A.

The Western New York Group of the TAPPI Empire State Section will meet at the Prospect House, Niagara Falls, N. Y. at 6:45 p.m. Wednesday evening, April 10th. E. A. Aitken, superintendent of the Bryant Press, Ltd., Toronto, Ont., will talk on printing problems. This firm handles the largest volume of work in Canada for American publishers. It specializes in book manufacture and four color letter press printing.

The TAPPI Empire State Section will meet at the Thousand Island Country Club on June 13, 14 and 15, 1946. Reservations should be made through Homer M. Rice, Trust Company Bldg., Watertown, N. Y.

The TAPPI Pacific Section will meet jointly with the Superintendents Pacific Division at the Gearhart Hotel, Gearhart, Ore., on May 17-18, 1946.

Charles W. Cassell, formerly of the Congoleum-Nairn Company, is now plant engineer for the Bryant Paper Company, Kalamazoo, Mich.

The Western New York Group of the TAPPI Empire State Section will meet jointly with the Niagara Branch of the C. P. P. A. Technical Section at the General Brock Hotel, Niagara Falls, Ontario on Wednesday, March 13th. Trevor Potts of the Imperial Chemical Industries will talk on wartime papermaking in England.

Frank E. Lovegren has returned from the Army to be chief chemist for the Inland Empire Paper Company, Millwood, Wash.

Recent visitors to the United States from Sweden include: Paul Lund, chief engineer of Munkedal A/B, William Tibell, production manager of Papyrus A/B, Molndal, and Rutger Larson, engineer for Stjernfors-Stalldalen A/B.

Products and Their Packaging

Developing Marketable Products and Their Packaging, by Ben Nash, product development consultant, was recently published by McGraw-Hill (404 pp. 5¾ x 9). Since production capacity under normal conditions is not a major problem there remains the problem of merchandising and marketability of all kinds of products. When the production lines begin rolling out thousands of competitive products of all kinds the companies with the most thorough knowledge of marketing details will have a great advantage over others.

An important element in marketing will be the method of packaging. Design, style, color, utility and many other package factors will need to be considered. Included are the following: outside packaging container; inside packaging bag, liner, etc.; label; closure; tags; wrappers, inner and outer; insert folders, leaflets, etc.; display card or display unit; and the shiping container. Related to these are the additional problems of size, materials to be used, text matter preparation, initial designing and development, model making, art work, typography, engraving color and printing plates, cutting dies or molds, handling, filling, sealing, labelling, packing material, shipping, etc., all of which enter into the cost.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $5.00 per copy.

Water Plant Manual

The Chemical Publishing Company recently published a Manual for Water Plant Operators by A. A. Hirsch, instructor in water purification, Louisiana State University. (386 pp. 5½ x 8½). This book is written for practical operators of water supply systems in preparation for their certification examination.

Some of the subjects covered are ground water, wells, surface water, storage, aeration, coagulation and sedimentation, filtration, disinfection, iron removal, softening, corrosion control, taste and odor removal, pumping, reservoirs, hydraulic measurement devices, chemical tests, water bacteriology.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y., at $6.50 per copy.

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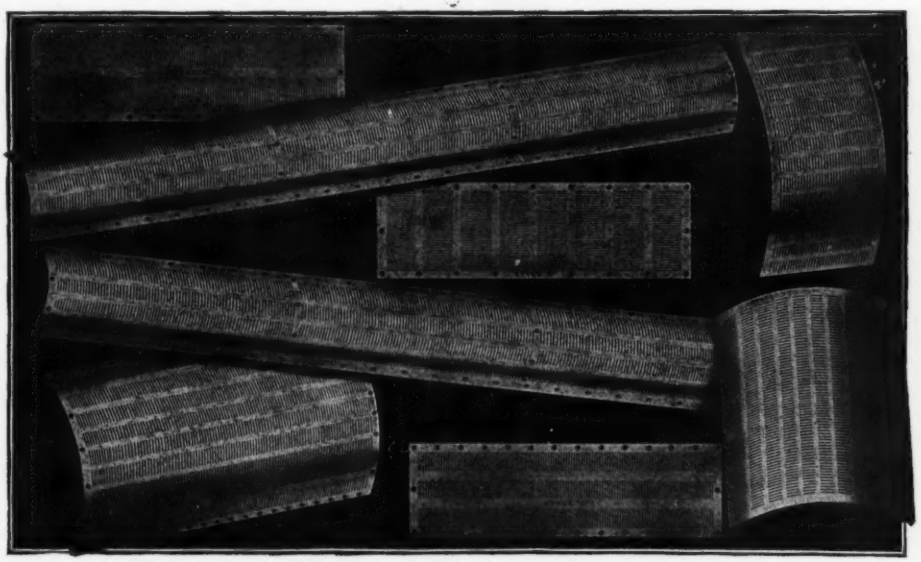

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MAGNUS METAL CORP. FITCHBURG, MASS.

New York Paper and Pulp Market Review

Paper Supply Lags Behind Reconversion Needs—Decline In Paperboard Production—Wood Pulp Imports From Finland and Norway Estimated At 200,000 Tons For 1946 — Paper Stock Trade Active.

Office of the PAPER TRADE JOURNAL,
Wednesday, April 3, 1946.

Demand for practically all paper and paperboard continues in excess of supply, despite a generally higher level of current production and a virtual cessation in withdrawals for military purposes. With the expectation that the major strikes in other industries will be settled soon, reconversion will be accelerated, but it is likely that the paper supply-demand ratio will remain out of balance for some time to come. The demand for paper products is so great that waste paper will continue to be a vital necessity as a raw material for the manufacture of new paper and paperboard.

Shortages in building boards and paper, printing papers, kraft wrapping and grocery-bag paper, wrapping tissues, container board, and folding and set-up boxboard are the result of increased buying to meet the tide of reconversion and building needs, as well as speculative buying. In some cases shortages of specific grades are reported to be the result of mills shifting production to other more profitable items, while production of certain products has felt the effect of pulpwood shortages, especially in the South.

The index of general business activity for the week ended March 23 rose to 132.6 from 131.1 in the previous week, compared with 143.8 for the corresponding week in 1945. The index of paperboard production fell to 162.0, compared with 166.1 in the previous week, and with 156.4 for the corresponding week in 1945.

Paper production for the week ended March 23 was estimated at 105.0%, compared with 92.1% for the corresponding week in 1945, with 90.3% for 1944, with 90.6% for 1943, and with 103.4% for the corresponding week in 1942.

Paperboard production for the week ended March 23 was 99%, compared with 99% for 1945, with 97% for 1944, with 95% for 1943, and with 101.0% for the corresponding week in 1942.

Wood Pulp

The extent to which domestic paper manufacturers can meet the anticipated heavy demand for paper in 1946 depends, to a substantial degree, on the amount of wood pulp which foreign producers can supply to American consumers. The importance of Swedish imports is reflected in the fact that Sweden should have available for export during 1946 about 1,700,000 short tons of wood pulp of which the United States might be expected to receive about 1,000,000 tons.

Norway and Finland, according to the Department of Commerce, can probably be expected to ship another 200,000 short tons of wood pulp. Added to expected Canadian shipments of some 1,200,000 short tons, would give the United States total foreign supplies of 2,400,000 tons, the greatest since 1937.

Rags

Mill buying of cotton cuttings this week is reported active. Demand is heavy with indications that supplies are inadequate to meet all orders. Market strong with prices firm at ceiling levels.

Demand for old cotton rags is active this week. The market is strong, with roofing felt mills buying in heavy volume. Prices are firm at ceiling levels.

Old Rope and Bagging

Manila fiber is in strong demand this week, but little trading is being done in other fibers. Demand for mixed strings is active at around 1.50.

Mill trading in scrap bagging is limited. The market is irregular with prices firm and unchanged. Supplies are still reported as limited.

Waste Paper

Demand for paper stock continues steady. Board mills are particularly eager to build up their inventories of all bulky grades. Prices remain firm at ceiling levels.

Jim McClain Joins Reinhold-Gould

Captain James P. (Jim) McClain, former field executive for Hammermill Paper Company, Erie, Pa., has joined the selling force of Reinhold-Gould, Inc., Manhattan fine paper merchants specializing in mill brand papers. McClain's association with Hammermill dates back to 1933 when he began his paper career there as an assistant in the control laboratories. He advanced to the sales department in 1936 and until 1942 served as field representative.

Early in 1942 he enlisted in the United States Army. He served in France and Germany with the 66th Infantry and advanced to the rank of Captain. After V-E day he was assigned to US Headquarters Force in the European Theatre and assisted in the control of German paper production.

Form New Colonial Firm

BOSTON, Mass.—The Colonial Paper Company, distributor of fine printing papers, has been incorporated by a group of six men, whose experience in the paper business ranges from 18 to 45 years. The office and warehouse of the company is located at 201-207 Purchase street. The company has bought the building at this address.

Officers are: William F. Butler, president; Sidney G. Ashley and Bertram B. Benge, vice-president; Clarence H. Conroy, treasurer; Wallace B. Callam, assistant treasurer; Sumner W. Newcomb, clerk of the corporation.

Paper Group Sponsors Session

CHICAGO—The Chicago Professional Paper Group sponsored one of the very interesting sessions held in conjunction with the Chicago Production Show and Conference held at the Stevens Hotel, Chicago, last week. The Group secured the services of Lambert VanRoy, chief chemist of the Central Paper Company of Menasha, Wisconsin.

ROLLS made READY for ROUGH HANDLING with STANLEY STEEL STRAPPING

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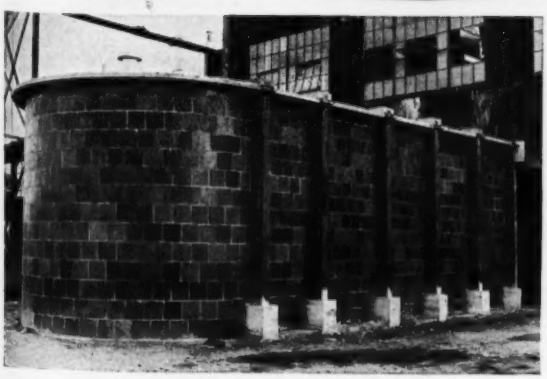
THE STANLEY WORKS STEEL STRAPPING DIVISION NEW BRITAIN, CONNECTICUT

You Paper Mill Men • take a Tip on Kalamazoo Tile Stock Tanks and Chests • you can't beat them for STRENGTH and DURABILITY •



Kalamazoo Vitrified Glazed Tile

is a "Natural" for Paper Mill Needs—

Smooth, hard, strong, easily cleaned and highly resistant to chemical action, this marvelous vitrified glazed tile type of construction is preferred by scores of leading paper mill executives and engineers. Adaptable for stock tanks and chests of all kinds. Costs no more than concrete tanks that require constant maintenance expense.

An exclusive method of glazed tile tank construction developed by Kalamazoo engineers. It provides greater flexibility and lower cost for all paper mill stock handling problems. Immediately available.

● Any Size or Shape Desired—

Wide, narrow—shallow or deep. Round, rectangular or square. Half-round or tapered bottom and corners. Midfeathers and fins where needed to control stock flow. Adaptable to pumps or agitators. Construction individually designed to meet space, tonnage or production requirements.

Ask for engineering data.

Kalamazoo TANK & SILO CO.
KALAMAZOO - MICHIGAN

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, April 3, 1946.

BLANC FIXE — Prices on Blanc fixe continue unchanged at prevailing levels. Demand is reported moderate this week. The pulp is quoted at $40 per ton, in barrels, at works. The powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—All-over demand continues heavy. Production good. Quotations are unchanged. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CASEIN—Demand in excess of current supply. OPO maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24½ cents per pound; less than 2,000 pounds, 24¾ cents per pound f.o.b. shipping point. Imported 24 cents.

CAUSTIC SODA—Demand heavy. Production large, but under demand. Market tight, Supply of drums short. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CHINA CLAY—Current demand is reported heavy on many grades of china clay. Quotations unchanged. Domestic filler clay is quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Demand heavy with supply adequate. Outlook favorable, but short supply of tank cars and cylinders slows shipments. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN — No offerings or sales. The OPA price on "G" gum rosin is $6.74 per 100 pounds in barrels, at Savannah. "FF" rosin is established quoted at $6.70 per 100 pounds, in barrels at New York. Average price on seventy per cent gum rosin size is $6.95 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake continue to be reported unchanged. Domestic salt cake is currently quoted at $15 per ton, in bulk. Chrome cake is currently quoted at $16 per ton. All quoted prices in car lots, f.o.b. shipping point.

SODA ASH—Demand for soda ash is reported heavy. Packaged shipments improving. Prices continue to conform to prevailing levels. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn market is reported steady. Cash offerings higher at 135,000 bushels. Demand heavy. Prices unchanged on starch. Pearl is quoted at $3.72 per 100 pounds. Powdered starch is quoted at $3.83 per 100 pounds. All prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand good. Supply situation improving. Prices of the commercial grades are currently quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.75 per 100 pounds. All prices in bags, car lots, f.o.b. works.

SULPHUR—Current consumption of sulphur continues heavy. Market situation unchanged. The quotation on annual contracts continues at $16 per long ton, f.o.b. mines. The current price on contracts at Gulf Ports is $17.50 per long ton.

TALC—Demand reported good. Domestic grades are currently quoted at from $16 to $21 per ton at mines. Canadian at $24 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$67.00	@	—
Sheets	75.00	@	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*54.00	@	—
Chip	*54.00	@	—
Sgl. Mla. Lt. Chip	*65.00	@	—
White Pat. Coated	*79.00	@	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items
Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items
Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper
Delivered in Zone 1:

No. 1 Glossy Coated	$13.65@$15.50
No. 2 Glossy Coated	12.40 " 14.00
No. 3 Glossy Coated	11.60 " 13.25
No. 4 Glossy Coated	11.15 " 12.75
No. 1 Antique (watermarked)	10.25 " 11.75
No. 2 Offset	9.60 " 11.00
A Grade E. F.	9.35 " 10.75
A Grade S. & S. C.	9.60 " 11.00
B Grade E. F.	8.85 " 10.25
B Grade S. C.	9.10 " 10.50
C Grade E. F.	8.55 " 9.75
C Grade S. C.	8.80 " 10.00
D Grade E. F.	8.25 " 9.50
D Grade S. & S. C.	8.50 " 9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers' Prices, Less Freight.
Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.50
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00 @ 82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi-Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	72.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

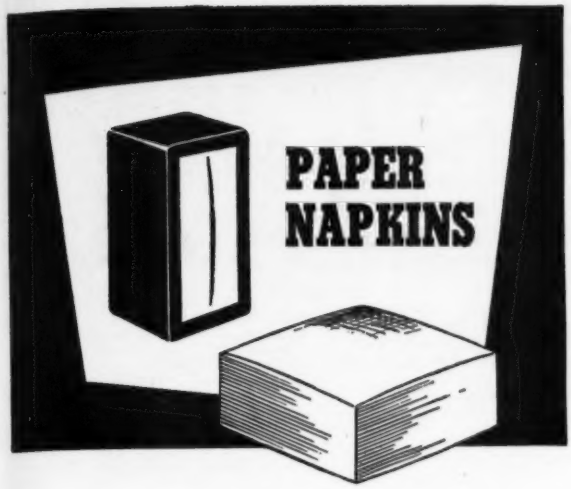
Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags
(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.



ANY fold desired. Plain, embossed or printed—our machines will make them. • High speed. An excellent product. Lowest production costs. • Start your post-war production program with the best equipment. Plan for this production now. • We will send complete information — ask us.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

★ ★

PHOTOVOLT
Photoelectric REFLECTION METER

For accurate measurement of

BRIGHTNESS
GLOSS
OPACITY
COLOR

of paper and paper products

Portable, rugged, simple to operate

Write for literature

PHOTOVOLT CORP.
95 Madison Ave. New York 16, N. Y.

Cowles
NU-NAP
TRADE MARK REG.

FELT WASHING DETERGENT

Cowles NU-NAP contains a new combination of products and a brand new idea in detergent action. NU-NAP does an outstanding washing job on paper machine felts—both on and off the machine. NU-NAP will give extra life to your felts—it leaves them unusually clean—fluffy and absorbent.

Use NU-NAP for dependable—safe—free rinsing felt washing.

Cowles Technical Service on Request

THE COWLES DETERGENT COMPANY
Manufacturers • Industrial Alkalies and Detergent Silicates
7016 EUCLID AVE. • *Paper Chemical Division* • **CLEVELAND 3, O.**

Old Rags

White, No. 1—			
Repacked	*3.80	@	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Thirds and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.30	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

Pre-War Quotations

All Prices Nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	@	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	1.50	"	—

* OPA Maximum Prices.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¾
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04½
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean Bright—			
Sisal Strings	.04	"	—
No. 2 Clean Bright—			
Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	1.60	"	—
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South America	—	"	3.25

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	1.60	"	—
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South America	—	"	3.25
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¾	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¼	"	.06¼
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03¾
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¼
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.06¼	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.85	"	—
Quality B	1.30	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—
Misc.	2.15	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—

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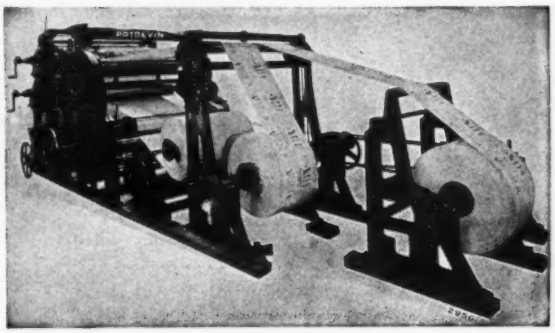

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NEW YORK IMPORTS

WEEK ENDING MARCH 30, 1946

SUMMARY

Newsprint	4,272 rolls
Printing Paper	13 cs.
Waxed Paper	10 cs.
Filter Paper	16 cs.
Toilet Paper	4 crates
Bowl Paper	30 bls.
Photo Paper	157 cs.
Decalcomania Paper	49 cs.
Miscellaneous Paper	8 cs.

NEWSPRINT

N. Y. Sun, Stuart Prince, Port au Basques, N. F., 633 rolls.
Clinton Paper Corp., by same, 451 rolls.
N. Y. World Telegram, by same, 234 rolls.
N. Y. Sun, Ravnefjell, Port au Basques, N. F., 2117 rolls.
Clinton Paper Corp., by same, 423 rolls.
N. Y. World Telegram, by same, 414 rolls.

PRINTING PAPER

Oxford University Press, Samtana, Liverpool, 13 cs.

WAXED PAPER

C. S. Allen Corp., American Farmer, London, 10 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., American Farmer, London, 16 cs.

TOILET PAPER

S. L. Christie, Drammensfjord, Bergen, 4 crates.

BOWL PAPER

Hurley Johnson Corp., Samtana, Liverpool, 30 bls.

PHOTO PAPER

Continental F'd'g Co., American Farmer, London, 152 cs. (raw base paper).
J. J. Gavin Co., by same, 5 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Santa Clara Victory, Liverpool, 49 cs. (simplex and duplex).

MISCELLANEOUS PAPER

Judson Sheldon Co., Oregon, Havre, 8 cs.

RAGS, BAGGINGS, ETC.

E. J. Keller Co., Inc., Exhibitor, Alexandria, 144 bls. old bagging & rags, 61 bls. new cuttings, 74 bls. old linsey garments.
A. W. Fenton Co., by same, 75 bls. old linseys, 109 bls. rags.
E. J. Keller Co., Inc., by same, 533 bls. white cottons, 176 bls. bagging.
(———) by same, 83 bls. tares.
Castle & Overton, Inc., Exhibitor, Alexandria, 77 bls. old cotton rags, 108 bls. old bagging, 270 bls. old white rags, 201 bls. old hessian bagging.
American Express Co., American Farmer, London, 11 pkgs. paperstock.
(———) by same, 27 bags wastepaper.
J. E. Bernard & Co., Santa Clara Victory, Liverpool, 20 bls. rags.
A. W. Fenton Co., Warrior, Buenos Aires, 454 bls. rags.
Americale Trading Co., Inc., by same, 6 bls. threadwaste.
Atlas Waste Manufacturing Co., by same, 5 bls. rags, 7 bls. threadwaste.
(———) Samtana, Liverpool, 117 bls. rags, 33 bls. threadwaste.
Atlas Waste Manufacturing Co., Randa, Havana, 59 bls. cotton waste.
(———) Beloit Victory, Glasgow, 227 bls. paperstock.
Harmon Lichtenstein Co., by same, 142 bls. old bagging.
D. Bennedetto, Inc., by same, 232 bls. old rags.
(———) Whistler, Melbourne, 28 bls. waste, 44 bls. waste rags, 22 bls. wool rags.
(———) Andrew Jackson, Calcutta, 94 bls. hemp cuttings.
Harmon Lichtenstein Co., Fort Finlay, Glasgow, 84 bls. hemp cuttings.
Castle & Overton, Inc., by same, 44 bls. paperstock, 314 bls. jutewaste.
State Street Trading Co., by same, 129 bls. paperstock.

OLD ROPE

E. J. Keller Co., Inc., Beloit Victory, Glasgow, 37 bls. 33 coils (old seine).
(———) by same, 40 coils, 33 bls. old rope.
(———) Andrew Jackson, Calcutta, 340 bls. old hemp rope cuttings.

GLUESTOCK

H. Remis & Co., Andalien, Havana, 504 bls.

CASEIN

American British Chemical Supplies, Inc., Warrior, Buenos Aires, 2000 bags ground lactic casein, 100,000 kilos.
Casein Co., of America, by same, 4100 bags ground lactic casein, 203,211 kilos.

NORFOLK IMPORTS

Elof Hansson, Inc., Stegeholm, Gothenburg, 5093 bls. dry bleached special rayon pulp, 1000 tons; 508 bls. viscose rayon pulp, Supergrade #11, 101 tons; 2544 bls. dry viscose rayon pulp, Supergrade #1, 150 tons.

Harris-Seybold Adopts New Name

At a special meeting March 28 stockholders approved a change in name of the Harris-Seybold-Potter Co. to Harris-Seybold Company and elected L. P. Wasserman, New York City, as an additional director, according to R. V. Mitchell, Chairman of the Board. Stockholders also approved revised by-laws and fixed the authorized number of directors at ten, it was announced.